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In the fall of 2002, the *Fondation pour la Recherche Stratégique* convened a small group of high-level experts on nuclear policy issues to discuss the consequences of September 11 and of the "war on terrorism" for nuclear debates. Participants met in Paris on September 26-27, 2002, and later provided papers which are reproduced here.

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NUCLEAR ISSUES IN THE POST-SEPTEMBER 11 ERA: EMERGING TRENDS

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What have been the effects of September 11 and the subsequent war on terrorism on the contemporary nuclear debate? This paper will argue that while they have not radically altered this debate, they have significantly impacted *all* nuclear policy issues. The degree to which they have affected these debates varies according to the issues. The events of September 11, the Afghan campaign, the anthrax scare, as well as the continued war on terror and the Iraq crisis, have emphasized the risks of nuclear terrorism in various forms. They have impacted the energy debate in several different ways, prompting the nuclear industry to review security practices and raising the spectre of attacks against power plants, but also questioning the over-reliance of industrialized nations on oil from unstable regions which provide breeding grounds for terrorism. They have heightened the fear of weapons or fissile material getting in the hands of rogue regimes or non-State actors, altered the terms of the nuclear non-proliferation and arms control debate, and raised serious questions about the meaning and efficiency of deterrence.

The Impact on the Risk of Nuclear Terrorism

Since the late 1980s, an increasing number of groups seemed inclined to cause a high number of casualties and were behaving outside the traditional framework of terrorism as an extreme form of "political bargaining". The destruction of the World Trade Center demonstrated for the first time that some of them would not hesitate in

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* Senior Research Fellow, Fondation pour la Recherche Stratégique. This paper benefited greatly from discussions in Paris at a seminar hosted by FRS on September 26-27, 2002, and in particular from the contributions made at that occasion by Lewis Dunn, Ariel Levite, Michael May, Alexander Pikayev, Brad Roberts, Frank Umbach, William Walker, Jon Wolfstahl, and Michael Wheeler. The author would like to thank Brad Roberts and Michael Wheeler for their comments on an earlier draft of this paper.

deliberately causing the simultaneous death of thousands of people, thus confirming the previsions of "catastrophic terrorism" made since 1997-1998. This has raised fears of a future "escalation to the nuclear threshold".

Thus the long-standing fear of nuclear terrorism has been dramatically revived. According to one account, in October 2001 President Bush ordered his national security team "to give nuclear terrorism priority over every other threat to the United States".[1] New sensors have reportedly been installed along US borders and in critical locations.

However, nuclear terrorism is a catchword that covers many different possible scenarios with very different consequences.[2]

- The first scenario is one in which a non-State actor would possess an operational nuclear weapon and would have both the will and the capability to detonate it in a Western city (the "Sum of All Fears" scenario). The probability of this scenario to materialize is generally considered as low.

- The second scenario is an attack against a nuclear installation. Civilian and military nuclear facilities in the world are subject to security and safety norms that go much beyond the practices of other industrial activities (such as the chemical and gas industries). Many analysts estimate that an effective attack against a nuclear power plant would be difficult to achieve, save a direct "precision strike" or an organized sabotage from the inside, both very demanding jobs. Nevertheless, the fear of the "next attack" has had a serious impact on the nuclear industry.[3] In most if not all countries producing electricity by nuclear means, the September 11 events have led to a review of security procedures. Early indications that the "fourth plane", which crashed in Pennsylvania, might have been headed for the Three Mile Island power plant, have raised the public awareness – and thus the political sensitivity – of this problem. Most reactor containment facilities are not designed to withstand a direct crash on containment facilities, to say nothing of the vulnerability of spent fuel pools.[4] In some countries (France, Hungary), emergency measures such as the deployment of air defenses near particularly sensitive nuclear installations were taken immediately after the September 11 attacks. Many experts believe that air defenses do not bring significant benefits in terms of risk reduction: it is by no mean certain that the time required for getting political authorization to strike a plane changing course at the last minute

1 Barton Gellman, "Fears Prompt U.S. to Beef Up Nuclear Terror Detection. Sensors Deployed Near D.C., Borders; Delta Force on Standby", *The Washington Post*, 3 March 2002, p. A1.
2 On this topic see the contribution by Michael May in this volume.
3 See the contribution by Frank Umbach in this volume.
4 Robert Alvarez, "What About the Spent Fuel?", *Bulletin of the Atomic Scientists*, January/February 2002, pp. 45-47. Reportedly, there are about 40,000 tons of spent reactor fuels in US commercial reactor sites.

would be available, and territorial air defense have been significantly degraded or reduced in some countries (such as Russia). But such measures can nevertheless have a positive psychological impact on populations.

- The third and probably most dangerous scenario because it would be relatively easy to achieve would be the explosion of a "dirty bomb", along the lines of the November 1995 incident, when Chechen rebels placed a crude radiological device (using cesium-137) in Izmailovo Park in Moscow. But crude or handcrafted radiological devices cannot be too powerful, since the blast could vaporize or over-disperse the nuclear materials attached to the bomb. Thus the "attractiveness" is in some way limited: in strict terms of cost-effectiveness, traditional terrorist methods such as simultaneous explosions in crowded places (as in Bali in October 2002) can be more appealing.

Does this mean that nuclear terrorism is unduly hyped? Probably not. The Fall 2001 anthrax scare, which affected many Western nations even in the absence of any concrete threat outside the United States (to say nothing of unrelated events such as the 2002 Washington sniper attacks), confirmed how much industrialized societies were vulnerable to disruption from a very small-scale aggression by non-conventional means. Thus any terrorist group willing and able to cross another threshold in the fight against the West could hardly discard this possibility.

There has been a debate about Al Qaeda's willingness to "go nuclear".[5] But there is also documented evidence that this was part of its options.[6] The organization has reportedly been cruising the nuclear black market since the early 1990s, and Osama Bin Laden has expressed his interest in nuclear weapons many times, including in a passionate 1998 piece entitled "The Nuclear Bomb of Islam".[7] Also, in October 2002, US intelligence reported that an aggression against a nuclear installation was indeed considered by Al Qaeda as the "next step".[8] The likely growth of the number of nuclear power plants in Asia in the coming years could, in this regard, provide more potential targets. And the control of lowly radioactive products commonly used in the industry such as strontium-90 or cesium-137 is virtually impossible to achieve.

Actions to reduce or mitigate those risks are being taken essentially at the national level. They include increasing physical security measures at sensitive nuclear installations, augmenting the number and effectiveness of sensors at border controls and other key points, enhancing early warning of terrorist threats, promoting a better security culture in scientific and industrial installations using nuclear materials, as well as reviewing civil protection and "consequence management" procedures for

5 Some Al Qaeda affiliates interrogated by Western governments have hinted that this was a "threshold" they were not prepared to cross.

6 See David Albright, Al Qaeda's Nuclear Program: Through the Window of Seized Documents, The Nautilus Institute, Special Forum 47, 6 November 2002.

7 Graham Allison, "Could worse be yet to come?", *The Economist*, 3 November 2001, p. 20.

8 Bob Woodward, Bush at War (New-York: Simon & Schuster, 2002), p. 271.

dealing with a nuclear event. They are complemented by efforts at the international level to ensure the protection of nuclear weapons and materials (see below).

The Impact on the Nuclear Energy Debate

Beyond immediate security concerns, September 11 and the "war on terrorism" have not significantly affected so far the broader nuclear energy debate. This is due to potentially contradictory effects.[9]

On the one hand, September 11 has shed a crude light on the security paradox that industrialized nations have faced for decades now: key countries producing a commodity vital for their growth are also dysfunctional States which provide breeding grounds for the most violent and brutal forms of terrorism against Western interests. Thus the debate that had begun to emerge in Europe and the United States since the late 1990s about the relevance of "reinvesting" in nuclear power has been boosted by the crisis.

On the other hand, the attractiveness of nuclear installations as potential targets and the costs of added security measures in the face of growing public concerns may, in the future, render electricity of nuclear origin more expensive than in the past.[10] The Chairman of the US Nuclear Regulatory Commission (NRC) has acknowledged "that the events of September 11 may have changed the perception of risks in our society, including the risks of nuclear power".[11] Shortly after the attacks, the NRC undertook a top-to-bottom review of security requirements. It has developed a new Threat Advisory and Protective Measures System and has re-examined the so-called Design Basis Threat (DBC) upon which mandatory security measures to protect nuclear plants are defined. Despite the NRC's efforts, some have criticized the Commission for failing to properly address so far the threat of a well-coordinated organized terrorist attack.[12]

Also, the war on terrorism may have a broader indirect impact on the nuclear energy market. The prospect of a more stable and cheaper oil flow in the future because of increased US influence in Iraq and Central Asia might slow down the "shift back to nuclear energy" that had emerged in the United States and Europe at the turn of the century.

9 For a broader discussion of nuclear energy issues see the in-depth analysis by Frank Umbach in this volume.

10 So far, the cost of new security measures in the United States has been 5-6 million $ per plant.

11 Richard A. Meserve, "Nuclear Security Issues in the Post-September 11 Environment", Speech before the Institute of Nuclear Power Operations, Atlanta, GA, 8 November 2001.

12 Daniel Hirsch, "The NRC: What Me Worry?", *Bulletin of the Atomic Scientists*, January/February 2002, pp. 39-44.

The Impact on "Nuclear Control" Policies

Little impact on traditional arms control

Nuclear arms control has not been radically altered by September 11 and the war on terrorism. At the margins, it could be argued that these events have led to further confirmation of the "arms control paradox" defined by Colin Gray: the easier it is, the less relevant it becomes. The new atmosphere of cooperation between Moscow and Washington made it possible to defuse the previously politically explosive question of missile defense, and to achieve a quick agreement on some mutually agreed principles for forces reduction (the Strategic Offensive Reductions Treaty). But this evolution was already in the makings before September 11. In any case, it is clear that the US-Russian strategic nuclear relationship is not as central for world stability as it used to be.

A refocusing of goals and means

In the broader domain of "nuclear control", the most important impact of September 11 has been on the question of physical security of weapons and materials, which have become a growing preoccupation for Western policy-makers. While the Bush administration was initially suspicious of "cooperative threat reduction" programs (and planned to reduce their budget by about 10%), September 11 and the war on terrorism have led to a policy reversal.

This increased support has been accompanied by a refocusing of nuclear control efforts towards addressing the most immediate concern – securing weapons and materials. Though no means to that effect have been excluded (including international regimes that not so long ago seemed irrelevant to many in the Republican camp), the Bush administration places higher value on unilateral action, *ad hoc* solutions and the use of force than its predecessor on multilateral agreements, permanent regimes and the use of diplomacy – an opinion reinforced by the realization that most regimes do not directly apply to non-State actors.[13] During the Clinton years, counterproliferation usually came second in the presentation of the tools to fight against WMD; in the *National Strategy to Combat Weapons of Mass Destruction* issued in December 2002, counterproliferation comes first.

Also, a lesson that will undoubtedly be learned from the Iraqi case is that regime change can be the most powerful and effective nuclear non-proliferation measure, as previously showed by examples such as Argentina, Brazil, and, in particular, South Africa. (To be sure, this argument should be used with caution, for it may underestimate the regional political and cultural incentives for going nuclear: it is by no means certain, for instance, that regime change in Iran or North Korea would in itself imply the end of their respective nuclear ambitions).

13 On these topics see the contributions by Alexander Pikayev and Jon Wolfsthal in this volume.

The security of nuclear warheads

The September-October 2001 events heightened the perception of nuclear weapons security risks in Pakistan. Experts generally agree that the Pakistani leadership has traditionally taken this issue very seriously. Indeed, some Pakistanis note that their country's track record is pretty good for a country that had "eight prime ministers, four presidents, six army chiefs, four dismissals of government and two military coups" since the inception of the nuclear program in 1975.[14] Islamabad took additional security measures shortly after September 11: press accounts have suggested that within 48 hours of the attacks on the United States, the arsenal was moved to six secret locations and the chain of command was restructured so as to isolate it from elements sympathetic to the Taliban regime, and that special forces had been deployed around the installations.[15] But they also generally agree that the Pakistani procedures are far below Western standards and would deserve being improved. There is a longstanding debate in non-proliferation and arms control circles about the extent of the assistance that could be provided by a nuclear power to a non-nuclear power within the bounds of international law (in particular Article I of the Nuclear Non-Proliferation Treaty) and domestic law. Pakistanis often say that past requests to the United States for assistance in nuclear C3 were been turned down. But they themselves fear that US assistance would reveal too much information about their capabilities, if not opening the possibility that Washington would ultimately "take control" of their arsenal.[16] As a result, it seems that only "half-hearted" offers of assistance were made since September 2001 by the United States, and that they have been met with equally "half-hearted" Pakistani acceptance (including because of domestic political sensitivities).[17]

Because of the fear of theft or sabotage, the security of nuclear arsenals within the official "Club of the Five" has also become a concern. Some claim that, in light of the motivations and means of Al Qaeda-type terrorists, even the physical security of the US nuclear weapons complex leaves much to be desired.[18] The alleged plan by a suspected terrorist with links with Al Qaeda to target the NATO nuclear base of Kleine Brogel, Belgium confirmed the fears of analysts.[19] Russian officials in charge of

14 Mushahid Hussain, "Media off target with Pakistan nuclear scare", *Asia Times* (Internet version), 7 November 2001.

15 "N-assets under foolproof controls: Sattar rejects analysts' fear", *Dawn* (Internet version), 2 November 2001; Molly Moore & Kamran Khan, "Pakistan Moves Nuclear Arsenal And Tightens Control Over Arms", *International Herald Tribune*, 12 November 2001, p. 1.

16 See for instance "Pakistan Rejects Help", *The Washington Times*, 19 October 2001, in reference to a visit by US State Secretary Colin Powell to Islamabad. However, Minister Sattar has also suggested that Pakistan may have given a positive reply at that occasion. See Greg Myre, "US Wants to Advise Pakistan on Nukes", *Associated Press*, 3 November 2001; "N-assets under foolproof controls: Sattar rejects analysts' fear", *Dawn* (Internet version), 2 November 2001.

17 See for instance Bryan Bender, "Pakistan: U.S. Visit Finds Continuing Obstacles to Nuclear Cooperation", *Global Security Newswire*, 8 October 2002.

18 Danielle Brian, Lynn Eisenman & Peter D. H. Stockton , "The Weapons Complex: Who's Guarding the Store?", *Bulletin of the Atomic Scientists*, January/February 2002, pp. 48-55.

19 "Al Qaeda Suspect Says He Targeted Belgian Nuke Base", *Reuters*, 14 November 2002.

nuclear weapons security say that additional protection measures have been taken since September 11, including with the creation of "rapid reaction" military units.[20]

There are therefore good reasons to refocus nuclear control efforts towards securing the weapons themselves. At the same time, losing sight of the dismantlement and elimination imperatives can be dangerous, because long-term storage may imply stronger risks of theft or capture. For this reason, US nuclear policies and the Moscow treaty have been criticized on the grounds that they do little to help the cause of fighting the risk of nuclear terrorism.[21]

In addition, the Moscow treaty was a missed opportunity to begin taking into account non-strategic weapons along the lines suggested by the Helsinki 1997 agreement. One might argue that further transparency on nuclear stockpiles would be detrimental to the overall security concern. After all, what would be the benefit of potentially revealing to a terrorist group the location of a nuclear depot? At the same time, continuing to exclude an entire category of weapons from the whole arms control and threat reduction effort would seem contradictory with the broader imperative of forbidding any access by terrorists to nuclear weapons. In addition, incidents such as the Kleine Brogel scare – if confirmed – might contribute to the perception that the control of non-strategic weapons has been neglected for too long.

The security of nuclear materials

If one leaves aside the possibility that terrorists would have direct access to an operational nuclear device, it is generally considered that the most critical hurdle facing groups willing to build such a weapon is gaining access to a sufficient mass of fissile material. While the concern about the security of such materials is shared universally (there may be about 3,000 tons of highly enriched uranium and plutonium in the world today), experts tend to agree on the key importance of securing fuel from research reactors, which are not submitted to the same kind of security measures as other nuclear facilities. There is about 20 tons of civilian HEU in research reactors worldwide in 2001 – a small quantity when compared with military stocks, but also one which is more widely spread in addition to being more vulnerable. The sense of urgency created by September 11 has made possible emergency actions such as the takeout of the spent fuel at the Vinca research reactor in Belgrade, arguably a model of cooperation between the US and Russian governments, and also of cooperation between governments and the private sector

20 See declarations of Colonel-general Igor Valynkin, chief of the 12th Main Directorate, reported in *Rossiyskaya Gazeta*, 1 November 2002.

21 Senator Carl Levin has argued that "by failing to destroy nuclear warheads, *the Nuclear Posture Review* would increase the threat of proliferation at the very time where the Al Qaeda network is known to be pursuing nuclear weapons" (Opening Statement of Senator Carl Levin, Chairman, Committee on Armed Services, Hearings on the Results of the 2001 *Nuclear Posture Review*, 14 February 2001, levin.senate.gov/floor/021402cs1.htm).

(the Nunn-Turner or Nuclear Threat Initiative). According to US Energy Secretary Abraham, there are 17 other facilities like Vinca that need to be addressed.[22]

The September 11 events have also fostered a renewed effort at the multilateral level. They have made possible new initiatives such as the much-touted "Global Partnership on Threat Reduction" decided at the Kananaskis G8 summit held in July 2002. (In Russia only, estimates of weapon-grade fissile material stocks vary between 850 and 1,150 tons.) The International Agency for Atomic Energy is working hard to promote the implementation of the Additional Protocol, review the adequacy of the Convention on the Physical Protection of Nuclear Materials to the current terrorist threat, and a UN convention on nuclear terrorism is being discussed.

In the medium run, concerns over the accumulation of weapon-grade nuclear materials might help revive the stillborn negotiation about a Fissile Material Cut-off Treaty. However, breaking the deadlock at the Conference on Disarmament would probably entail a pre-requisite: that of taking care of Chinese (and, to a lesser extent, Russian) unease about US plans to deploy strategic defenses, possibly including offensive weapons in extra-atmospheric space. No such outcome was in sight in early 2003.

The Impact on the Dynamics of Nuclear Proliferation

The crisis opened by September 11 has had mixed effects on nuclear proliferation. It has led to the stigmatization of some nuclear programs but also, for different reasons, to the legitimization of others. It has heightened the perception of the potential dangers of nuclear proliferation but also increased the risks of further proliferation.

The war on terrorism is, to some extent, good news for nuclear non-proliferation. For the Bush administration, September 11 made the idea of nuclear weapons in the hands of autocratic regimes hostiles to the West and having demonstrated their willingness to hurt Western interests even more unacceptable than before, to the point that the "war on terrorism" has also become, to some extent, a "war on proliferation". The three countries called members of an "axis of evil" by President Bush in his January 2002 State of the Union address were notoriously nuclear proliferating countries. In particular, September 11 considerably bolstered US resolve to get rid of the Iraqi nuclear problem once and for all: a country technically in a state of cease-fire with the international community, Iraq deserved from a legal point of view being singularized among those three. Action against Iraq may serve as a useful "to whom it may concern" warning to other States.[23] And the new US strategy to deal with weapons of mass destruction firmly puts counterproliferation as the "weapon of choice". Also, the establishment of "less unfriendly" regimes in Afghanistan and Iraq may soften the pressures in Iran for going further down the nuclear road.

22 *Global Security Newswire*, 15 November 2002.

23 Cuba's long-awaited decision to join the NPT may have been influenced by recent US policy orientations.

However, like it or not, a paradoxical consequence of the war on terrorism is that it may have also indirectly *favored* nuclear proliferation. This could be the case in three different ways.

First, US policies may contribute to a delegitimization of the nuclear non-proliferation norms.

- The need to gain Pakistani support for action against Afghanistan had led Washington to lift most of the sanctions imposed after the 1998 nuclear tests. Since India already had a friendly relationship with the United States, it would of course have been unthinkable not to do the same for that country. While stemming from a perfectly understandable rebalancing of US strategic priorities, this gesture amounted to a de facto recognition of the legitimacy of the two South Asian nuclear programs. The lifting of sanctions against Pakistan (and by ricochet India) has been perceived, rightly or wrongly, as a confirmation of a US readiness to accept nuclear proliferation as long as it does not directly hurt its immediate security interests.

- The lack of immediate action after the North Korean revelations about the DPRK's enrichment program and subsequent withdrawal from the NPT may also contribute to the belief that the United States has "double standards" on nuclear non-proliferation.

- Serious assistance efforts to nuclear-capable countries such as Pakistan to help them secure their warheads have been justified, not appropriately, by the "clean needles to drug addicts" argument, with once again the danger of nuclear terrorism as an overriding imperative. But if they could also be perceived by spectator countries as violating at least the spirit of the NPT, thus contributing to its de-legitimization.

- To a lesser extent, the same thing could happen to Iran.[24] In retrospect, the stigmatization of the Iranian regime in the January 2002 State of the Union address seemed to have been more driven by immediate concerns about support to terrorist actions against Israel than by the nascent Iranian nuclear program. Indeed, Iran was not explicitly mentioned alongside Iraq and North Korea in the US National Security Strategy published a few months later.[25] Some US officials have argued that they can "live with" an Iranian nuclear bomb just as they "live with" a Pakistani one, giving the impression that the NPT was a secondary concern, especially given the need for Iranian support in the war against terror (and for Iranian non-interference in the Iraqi crisis). It

24 On Iran see the contribution by Alexander Pikayev in this volume.

25 Neither was Iran mentioned alongside Iraq and North Korea in the speech by John Bolton, US Undersecretary of State for Arms Control and International Security, at the opening session of the Conference on Disarmament on 24 January 2002.

seems that, like in the case of Pakistan, immediate security interests may have taken precedence over the broader concern of nuclear proliferation, thus raising once again the vexing question of "double standards".

- As Iraq is being punished for blatantly violating its nuclear non-proliferation commitments, another country with strong motivations for nuclear program might consider that, after all, it might be better to withdraw from the NPT altogether (on supreme national interests grounds) than to cheat. That may incite others to follow suit, unravelling the whole regime.

- Finally, the most recent discussions on the establishment of a Central Asia Nuclear Weapon Free Zone have confirmed Russian hesitations in subscribing to such a concept, which may have been heightened by the war on terrorism and the growing US presence in the region.

Second, US policies and actions could contribute to an increase in the "offer" of nuclear technologies.

- If the United States needs stronger support from Moscow and Beijing in the war on terror, it might be less inclined in the future to demand harsher policies towards those Russian and Chinese entities which, for commercial reasons, export products and technologies useful for nuclear programs.

- Also, the lifting of sanctions against Pakistan and India may be taken as a "green light" by some exporters of nuclear technologies.[26]

- Following the sudden revival of the US-Pakistani alliance in September 2001, supporters of the Taliban in the Pakistani military and intelligence establishment may have been tempted to deliberately transfer nuclear expertise to Al Qaeda, or to countries hostile to the United States (North Korea, or Libya[27]). On 23 October 2001, Pakistani authorities arrested two former nuclear scientists who admitted having had contacts with Al Qaeda.[28]

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26 According to Nikolai Sokov, "the removal of sanctions by the United States against India might be taken by Moscow as a green light, a sign that it is acceptable to develop cooperation with India, including on nuclear and missile technology. The same logic applies to Iran." (Special Section on the September 11, 2001, Attacks. Roundtable on the Implications of the September 11, 2001, Terrorist Attacks for Nonproliferation and Arms Control, *The Nonproliferation Review*, Fall-Winter 2001, p. 12).

27 Information about Libya from Barton Gellman, "Fears Prompt U.S.…". While Pakistan's Strategic Planning Division is now nominally in charge of nuclear security and nuclear exports (Andrew Koch & Christopher F. Foss, "Pakistan strengthens nuclear security", *Jane's Defence Weekly*, 9 October 2002, p. 25), there have been indications that transfers to North Korea have taken place as late as the summer of 2002.

28 "Two retired Nuclear Scientists admit to meeting Osama bin Laden", *Dawn* (Internet version), 12 November 2001; Kamran Khan & Molly Moore, "2 Nuclear Experts Briefed Bin Laden, Pakistanis Say", *Washington Post*, 12 December 2001, p. A1.

- The growing instability of Pakistan as an organized State has heightened the fears of a sudden disintegration with unwelcome consequences, such as the transfer of Islamabad's weapons abroad (perhaps to Saudi Arabia), or a battle for the control of Pakistani warheads.[29]

Third and perhaps most importantly, US policies may contribute to an increase in the "demand" – that is, boosting nuclear temptations.

- The legal enquiry about the responsibilities for the September 11 events, as well as the reinforcement of international cooperation against the financing of terrorism, has brutally revealed the ambiguities of US and Western support for Saudi Arabia. A reshuffling of geopolitical cards in the Middle East which would include the perceived abandonment of the Saudi kingdom could very well revive the ruling circle's interest in nuclear weapons. In such circumstances, the tight links that exist between Pakistan and Saudi Arabia might evolve into the conception of a *de facto* "Islamic Bomb".

- One hypothesis to be taken into account for the future is an extreme scenario where Al Qaeda took *de facto* control of territory under the nominal sovereignty of a future "failing State" (Yemen? Saudi Arabia?) and managed to sanctuarize it with nuclear weapons. It is to be noted that, however frightening the thought, this hypothesis could be dealt with, to some extent, through the familiar tools of deterrence by the threat of retaliation on the adversary's territory.

- A US military presence in Iraq, Central Asia, and Afghanistan may increase the pressure on Teheran's nuclear drive, as a future guarantee for the long-term protection of its territory. New announcements and revelations in late 2002-early 2003 about Iran's nuclear plans, as well as Tehran's continued refusal to accept reinforced IAEA safeguards, support this idea.

- Finally, actions taken to reduce the threat of terrorism and the increased tempo of US military operations in the Middle East and Asia, added to recent evolutions of US strategy and defense policy – a new emphasis on "pre-emption" options, a significant rise of the defense budget – are likely to bolster the idea often expressed in developing countries since the end of the Cold war, and in particular since the 1991 Gulf war (as witnessed by some Indian and Libyan declarations at that time), that "only nuclear weapons can guarantee

29 US sources have suggested that in 1999, Islamabad had contacted the Taliban to explore the option of transferring Pakistani weapons to Afghanistan if needed. (Moore & Kamran, "Pakistan Moves Nuclear Arsenal…"). On the option of a "forced exfiltration" of Pakistani warheads by India or the United States – and its difficulties – see the hotly debated piece by Seymour M. Hersch, "Watching the Warheads. The risks to Pakistan's nuclear arsenal", *The New Yorker*, 5 November 2001, pp. 48-54.

your security". The new US national security strategy, and Washington's resolve to strengthen counter-proliferation efforts, may have encouraged North Korea in its own nuclear designs. At first glance, there does not seem to be any direct relationship between September 11 and North Korea's forced nuclear "coming out" of October 2002. But Pyongyang's leaders have sought publicly to legitimize their nuclear program by emphasizing that their were the consequence of US war rhetoric and alleged nuclear planning against their country, noting the inclusion of the Democratic People's Republic in George Bush's "axis of evil". Also, it is possible that Pyongyang took advantage of the US focus on Iraq at that time to embarrass the Administration.

To a lesser extent, the war on terrorism may have also indirectly heightened the risks of nuclear *use*. The Afghan campaign may have bolstered Al Qaeda, its allies or affiliates to bring the war to Kashmir, while the Indian government was for its part encouraged in taking harsh measures against terrorism. Hence the year-long military face-off that took place in South Asia, which may have brought the two countries closer to war that they had been in the past three decades, with the ensuing risks of nuclear use.

The Impact on Western Nuclear Deterrence Policies

September 11 as a quasi-nuclear crisis

The energy released by the three September 11 planes crashes was roughly equivalent to the use of a tactical nuclear bomb, and, because the attacks were unexpected, "unsigned", and so well coordinated, the United States experienced to some extent that day the conditions of an out-of-the-blue nuclear strike.

Somewhere between 0925 and 0945 Eastern Time that day, the Transportation Secretary activated Security Control of Air Traffics and Navigation Aids (SCATANA), a plan to ground all planes in case of a nuclear attack. At 0950, the Pentagon ordered the take-off of the National Emergency Airborne Command Post. At the same time, US forces were placed in DEFCON 3 for the first time since 1973, an alert status which remained in place until September 14. Around 1450, after a short stop at Barksdale Air Force Base (the alternate STRATCOM command post), President Bush arrived at STRATCOM HQ in Nebraska, the closest secure location that allowed for encrypted videoconferencing between national leaders. The "Continuity of Government" (CoG) program was also activated: Vice-President Cheney had the Chairman *pro tempore* of the Senate and the Speaker of the Chamber evacuated (and after September 13 himself would remain physically separated from the President[30]). That night, the first crisis meetings took place in the Presidential

30 Some press reports indicated that, weeks after the attack, Mr. Cheney was still spending "close to 80%" of his time in a location "believed to be outside the fallout range of a small nuclear weapon". See Stephen L. Schwartz, "Where's Dick?", *Bulletin of the Atomic Scientists*, January/February 2002, p. 7.

Emergency Operations Center (PEOC). Thus in many respects, September 11 could be termed a quasi-nuclear crisis: a dramatic and unexpected dress rehearsal for large-scale surprise nuclear attack. It revealed both the relevance of having maintained some of the Cold war procedures, and the low readiness of the US government to cope with such events : the activation of the CoG procedures reportedly took place amid great confusion, many Administration actors being unaware of the course of action they were supposed to take.[31] Months later, due in particular to the fear of a possible nuclear attack on Washington DC, the CoG program was still in operation: a "shadow government" of about 100 senior government officials was still running in two secure and secret locations on the East Coast.[32]

The debate on US nuclear weapons use

There does not seem to have been any serious consideration of nuclear use by the US government during the Fall of 2001, be it in the immediate aftermath of September 11 or during the Afghan campaign, thereby confirming the longstanding and widely held assumption that nuclear deterrence does not apply to non-State actors. Some segments of US public opinion were arguing for a nuclear response, as one could see just by spending a few hours on Web discussion groups and various Internet chat rooms. But the voices calling publicly and explicitly for nuclear use, such as Representative Steve Buyer or former DIA analyst Thomas Woodrow, were isolated.[33] When pressed, US authorities often refused to rule out nuclear use; but that was consistent with traditional practice. Also, arguably, the weeks following September 11 was not a time to diminish the credibility of nuclear deterrence.[34] In any case, Defense Secretary Rumsfeld at one point stated clearly that that "we've not given consideration nor discussion to that particular issue".[35]

As a thought experiment, it is useful to wonder whether a nuclear response would have been seriously considered if the attack had been initiated by an identified State government. Despite its magnitude, the number of victims of the September 11 attacks remained below what many considered to be the potential threshold for nuclear use: for instance, on the eve of the 1991 Gulf war, officials and analysts who were willing to consider nuclear use generally mentioned it in the hypothesis of an

31 Data about the sequence of September 11 events from Stephen S. Schwartz, "Foreword", in L. Douglas Keeney, *The Doomsday Scenario* (St Paul, MN: MBI Publishing Company, 2002), pp. 9-20; and Bob Woodward, "Ten Days In September", *Washington Post Series*, January 2002.

32 Barton Gellman & Susan Schmidt, "Shadow Government Is at Work in Secret. After Attacks, Bush Ordered 100 Officials to Bunkers Away from Capital to Ensure Federal Survival", *The Washington Post*, March 1, 2002, p. A1.

33 To be fair, US Representative Steve Buyer (R-Ind) said he favoured nuclear use if it was proven that Al Qaeda was behind the anthrax attacks (www.indystar.com, 18 October 2001). Thomas Woodrow went further by writing in the *Washington Times* ("Time to Use the Nuclear Option", 14 September 2001) that "at the bare minimum, tactical nuclear capabilities should be used against the Bin Laden camps in Afghanistan".

34 For an example of a US official eluding the question, see News Transcript, Secretary Rumsfeld Interview for *ABC This Week*, September 16, 2001, www.defenselink.mil/news/Sep2001/t09162001_t0916sd.html.

35 Quoted in Arkin, "Some things…"

Iraqi attack making fatalities an order of magnitude above the September 11 toll (that is, tens of thousands rather than thousands). And on that day, despite the disruption caused in the political, economic and social life of the country, federal institutions continued to function. It was therefore appropriately judged by President Bush that "the foundations of the United States were not attained". Nevertheless, since some of the very nerve centers of the country were attacked, it is probable in such an hypothesis that some in the Administration would have argued in favour of selective nuclear use against the attacking country in order to deter a second use and thus "restore deterrence". In any case, the value of such a thought experiment remains limited if one assumes that, precisely because of the fear of nuclear retaliation, no country would have openly defied the United States that way. (Another, more intriguing question must nevertheless be raised: what would have been the tonality of the internal debates in the US government and of the public opinion debate on that issue if there had been undisputed evidence that Al Qaeda had been possessing an operational nuclear device?).

This helps explaining why September 11 has not fundamentally altered the nuclear deterrence debate *per se*, while encouraging the search for "new concepts" of deterrence.

The debate on deterrence strategy

The work on the US Nuclear Posture Review had been largely done by September 11, and it does not seem that the attacks prompted any significant change to it (with the possible exception of an added emphasis on "unexpected contingencies"[36]). September 11 nevertheless certainly reinforced the hand of those who were arguing in favour of a new look at the question of deterrence: it accelerated the debate on the need to go beyond the Cold war "twin pillars" of containment and traditional deterrence, and to devise new approaches with Russia one the one hand, and with so-called rogue States on the other. Potential new adversaries are increasingly deemed by many Western policy makers to be characterized by a suicidal mentality and a high tolerance for casualties (including through the use of human shields), and to have mastered the use of concealment techniques and provide "low signatures". Such features could make effective deterrence very difficult to achieve, both on the side of declaratory policy and targeting plans. Non-State actors such as Al Qaeda are often deemed to be not receptive to the use of traditional deterrence practices, for material (the absence of a territory) or cultural (the "apocalyptic" nature of their cause) reasons. Added to that mix is that for many in and around the Bush administration,

36 Some experts nevertheless believe that the NPR emphasis on the need for more tailored new nuclear capabilities is linked with the war on terror. According to Loren Thompson of the Lexington Institute, "A large part of Osama bin Laden's calculus is that we were too soft to respond. They want to at least create the impression that that is not the case" (quoted in Ann Scott Tyson, "Nuclear plan changes calculus of deterrence", *The Christian Science Monitor* (Internet version), 14 March 2002.

the very idea of a bilateral deterrence relationship between the United States and, say, Iraq, is morally repugnant.

The idea that an organization such as Al Qaeda cannot be the subject of deterrence needs to be qualified. First, Al Qaeda came fairly close to effective control of a State (Afghanistan); in such a hypothesis, the traditional exercise of deterrence would at least be conceivable.[37] Second, Osama bin Laden has justified many times the September 11 attacks as a reprisal for US "aggression", thereby implying the he is receptive to the "tit-for-tat" logic which is the foundation of classical deterrence.[38] Third, Bin Laden has in fact explicitly claimed to *practice* a form of deterrence: in an October 2001 interview, he reportedly said that "if America used chemical or nuclear weapons against us, then we may retort with chemical and nuclear weapons. (..) We have the weapons as deterrent".[39] (Noteworthy is the fact that neither the question nor the answer mentioned *biological* weapons: since this was in the midst of the anthrax crisis, Bin Laden might have tried to distance himself from this event. It is to be noted, however, that the journalist's question did not mention biological weapons either.) Finally, some in the Bush administration do seem to credit Al Qaeda with a receptivity to deterrence: in October 2002, CIA director George Tenet reportedly emphasized that the US authorities should "tell the terrorist what they know" about possible new attacks in order to deter them.[40]

In any case, September 11 has given a boost to the search for new concepts and solutions to cope with the perceived growing threat of WMD use against US or allied interests. Three directions are being explored simultaneously by the United States.[41]

- The first direction is ballistic missile defense, about which a debate erupted shortly after the attacks: those who thought that missile defense did not protect States about the "real" emerging threats felt vindicated.[42] But proponents of missile defense rejected the argument by emphasizing the unexpected an brutal character of the September 11 attacks in support of their own cause. For them, because no one could foresee "where the next attack would come from",

37 Of course, the discussion does not end here, and the following question must be raised: would an established government – thus a subject of classical deterrence – have taken the responsibility to perpetrate such acts as the September 11 attacks?

38 See for instance a 1997 interview quoted in William M. Arkin, "Some things never change", *Bulletin of the Atomic Scientists*, November/December 2001, p. 80.

39 Hamid Mir, "Osama claims he has nukes: If US uses N-arms it will get the same response", *Dawn* (Internet version), 10 November 2001.

40 See Woodward, *op. cit.,* p. 271.

41 Apart from the United States, one could argue that Israel may be the only other country to have refined its strategic thinking the same way, having added over the years pre-emption options (cf. the Osiraq precedent) and territorial missile defense (the Arrow system) to widely-assumed "non-conventional" deterrence options.

42 As Senator Carl Levin said, "Never again will supporters of national missile defense be able to claim, as President Bush did in May, that ballistic missiles in the hands of rogue regimes constitute 'today's most urgent threat'". Senator Carl Levin, "A Debate Deferred: Missile Defense After the September 11 Attacks", *Arms Control Today* (Internet version), November 2001.

and because a taboo had been broken, missile defense was an indispensable element of an improved homeland security concept. The Administration was obviously in the latter camp.

- The second direction is new concepts of deterrence. It seems possible to include in this much-touted and rather vague category (devised before September 11) at least four different notions. One is "dissuasion", corresponding more or less to a combination of two well-known concepts, "deterrence of acquisition" and "deterrence by denial". The mere possession of various US military capabilities are deemed to discourage State and non-State actors to invest in asymmetric means such as ballistic missiles and NBC weapons, by suggesting that such actors would be denied any significant benefit in making clear that the United States could destroy adverse arsenals (by high-precision conventional means) or defend itself against them (by ballistic or non-ballistic defenses). Another is what could be termed "personal deterrence". Leaders are encouraged to think about the *personal* consequences of an NBC use against US interests by looking, for example, at what happened to former President Slobodan Milosevic. Such a concept was already implicit in the famous letter from President George W. Bush handled by US State Secretary James Baker to Iraqi Foreign Minister Tarik Aziz immediately before the 1991 Gulf war. But because of lingering doubts that a leader such a Saddam Hussein would be deterred by this threat, it can also be suggested through various means to subordinates that they too would be held personally responsible were they to carry out an order from the top to use weapons of mass destruction. US Defense Secretary Donald Rumsfeld has even suggested that NBC use would be considered a "war crime" (a dubious proposition from a strictly legal point of view). Finally, a third concept is what could be called "indirect deterrence", in which the target would not be the supposedly undeterrable sub-State actor, but countries that support it.[43]

- The third direction is pre-emption. While the pre-emption option have always figured in the US defense policy menu (including *vis-à-vis* the Soviet Union), the Bush administration has elevated its importance considerably. The 1981 Israeli strike against the Osiraq reactor, at the time condemned, is now considered by Washington as an example. The Iraqi case was to be the first test of the new US policy, while arguably falling, from a legal point of view, in the much more debatable category of "prevention" rather than "pre-emption". Also, in early 2003, some in the US administration were arguing in favour of the preventive strike option against North Korea despite the risks of such a plan.

43 As Condoleezza Rice reportedly suggested in October 2002, "They may not be deterrable, but we can discourage others who would support [Bin Laden] and incentivize them to turn on him". President Bush seemed to share that view. (See Woodward, *op. cit.,* p. 213, p. 218).

The debate on nuclear doctrine

The *de facto* alliance forged with Russia after the attacks did not affect the apparent US decision to maintain massive nuclear strike options against that country, and the sizing of US nuclear forces appear to still take into account counterforce missions against the Russian arsenal. It seems that the Administration "could not take that last step" of renouncing the ability to quickly generate massive nuclear strike options against Russia.

The anthrax crisis, an event in many ways linked with September 11 even though apparently not prompted by the action of international terrorists, has heightened the fear of biological attacks and thus reinforced the concept of deterring the use of such weapons through nuclear deterrence. The United States has maintained for the past decade a policy of "deliberate ambiguity" on that issue, mentioning the option to use "all means available" or promising an "overwhelming and devastating response" of unspecified nature. Since September 11, the Bush administration has shown no signs of a willingness to make any significant change to that policy. One reason is that it seems to have passed the test of time, having been confirmed by the Clinton administration. Another is simply the presence at the highest levels of the Administration of officials who already had important functions during the first Gulf war (when the policy was first articulated): their natural inclination after September 11 was apparently to confirm the US doctrine.[44] Indeed, despite the interpretation given by some analysts, the language used by the *National Strategy to Combat Weapons of Mass Destruction* issued in December 2002 ("right to respond with overwhelming force") was *not* a departure from the one used by the previous administrations.

One caveat must be added: current US officials seem more comfortable with the concept of nuclear deterrence of biological use than their predecessors under the first Bush and Clinton administrations (which were very careful to avoid giving the impression that they were violating the "negative security assurances" given to non-nuclear States).[45] The events since September 11 have certainly reinforced their convictions in that regard, just as it has for some US security analysts who argue for a more direct and explicit for nuclear weapons here. Hence the rather strong expression "including through resort to all of our options" included in the *National Strategy to Combat Weapons of Mass Destruction.*

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44 See Woodward, *op. cit.,* p. 218.

45 US Undersecretary of State for Arms Control and International Security John Bolton declared in early 2002: "We are just not into theoretical assertions that other administrations have made… The idea that fine theories of deterrence work against everybody, which is implicit in the negative security assurances, has been disproven by September 11… We would do what is necessary to defend America's innocent civilian population" (quoted in Nicholas Kralev, "U.S. drops pledge on nukes", *The Washington Times* (Internet version), 22 February 2002. White House Chief of Staff Andrew Card had used a similar language in October 2001: when asked whether the United States would respond with nuclear weapons to a chemical or biological attack, he said "we're going to do everything we can to defend the United States" (Dana Milbank, U.S. Pressed on Nuclear Response. A Policy of Less Ambiguity, More Pointed Threat Is Urged", *Washington Post*, 5 October 2001, p. A16.)

For its part, the UK Government has reiterated in 2002 its longstanding policy of threatening a "proportionate response", possibly nuclear, to a chemical or biological use by Iraq.

One final lesson of September 11 here, though, is that the validity of nuclear deterrence *vis-à-vis* non-WMD threats against Western States has perhaps been discarded to quickly. Before September 11, policymakers and analysts could believe that, more than ten years after the Cold war, there was no conventional threat facing NATO countries that would warrant the exercise of nuclear deterrence. But has not September 11 demonstrated that enormous damage and mass casualties were possible without resorting to NBC weapons, or even by any kind of military means? One might argue, therefore, that conventional *non-military* aggression by a State could fall in the real of nuclear deterrence. Proponents of a "no-first-use-of-WMD" doctrine seem less credible and reasonable than they were before September 11.

The Impact on Nuclear Competitions

The main strategic competitions between nuclear-capable countries have been, for the moment at least, considerably dampened by the war on terrorism.[46]

Rivalries between the "big nuclear three" (China, Russia, and the United States) have considerably decreased. Russian reactions in the immediate aftermath of the September 11 attacks and the contribution it has brought to the fight against international terrorism have helped closing the Cold war books for good. Such reactions bolstered those in the Bush administration who thought that traditional arms control measures belonged to the past, as they reflected neither the tilt of Russia, until then neither an adversary nor an ally, towards the status of a true security partner, nor the sense of urgency brought by the immediate terrorist threat. The US-China "balance" is different. Until September 10, the fundamental issue of US-China deterrence promised to be the next great nuclear debate. As a result of changing US strategic priorities and of the new atmosphere of cooperation between Washington and Beijing (not so long ago touted as a potential "strategic competitor"), it has for all practical purposes left the stage of mainstream US strategic analysis, and experts note that the People's Republic as a nuclear actor is now way at the bottom of the priorities list from the White House's point of view. The Chinese reaction to the US withdrawal from the ABM treaty was extraordinarily muted as compared with the rhetoric used by PRC officials during the years 1999-2001. However, the strength of the political and military dynamics of this issue (the question of Taiwan, the Japan-US alliance, the future role of China in Asia, etc.) suggest that it will re-emerge as a central issue sometimes in this decade irrespective of the evolution of the war on terrorism (which itself might include some US-China frictions if Washington's military activities in Central Asia were to grow). The actual deployment of some missile defenses around

46 On this topic see the contributions by Brad Roberts and Michael May in this volume.

2004 will probably force Beijing to make choices in the menu of options it has in its modernization program in order to make China able to evade, counter or saturate such defenses.

The exception is the Asian nuclear triangle. The rivalry between India and Pakistan has been if not heightened, at least "locked in", by the effects of September 11 and the Afghan campaign. The US-Pakistan connection and the simultaneous lifting of sanctions against Islamabad and New-Delhi has resulted in a "re-equalization" of status between the two South Asian powers. India, which was on its way to be recognized by many as a coming world power, was, to use the words of one expert, "back into its regional box". The operation against Afghanistan probably had some spillover effect, with Islamist terrorists feeling encouraged to bolder actions (such as the one against the Indian Parliament). For its part, India has felt its own counter-terrorism action legitimized both by new terrorist attacks and by the US campaign, enhancing the risks of military escalation in South Asia in case of Indian actions across the Line of Control.

For its part, the nuclear rivalry between India and China may seem less relevant today with the international policies of both countries being largely focused on terrorism and their relations with Washington; however, the "root causes" of their competition have been mostly unaffected by the war on terror.

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To sum up, events since the morning of Tuesday, September 11, 2001, have not radically altered the nature of the nuclear debate. They have nevertheless produced very significant effects, sometimes of paradoxical or contradictory nature, on nuclear policies, generally encouraging existing trends.

But perhaps the most important lesson of September 11 and the war on terrorism in this regard is not in the nuclear field *per se*. Framing it requires taking a broader view, which allows for discerning a paradox: while the word "nuclear" appears everywhere in the post-September 11 security debate, it nevertheless appears that the way the United States and its allies have ceased to place the possible use of nuclear weapons at the center of their security policies; for the first time since 1945, the definition of the foundations of Western security is decoupled from the debate on nuclear deterrence.

NUCLEAR ENERGY ISSUES – GLOBAL DIMENSIONS AND SECURITY CHALLENGES

Frank Umbach[*]

Introduction

Since September 11, 2001 nuclear, biological and chemical weapons pose a greater threat at any time before. In the 1960s, security experts anticipated that by the turn of the century 40-80 states would possess nuclear weapons. Today, only eight have acquired them: USA, Russia, China, France, Great Britain, Israel, India and Pakistan. Four countries – South Africa, Belarus, Ukraine and Kazakhstan — had given up their nuclear ambitions during the last decade.[1]

While nuclear power provides nearly 17 percent of the world's electricity demand[2], it is also the back door through which determined states could go to acquire nuclear weapons. As the result of civil and military programmes, the world has an estimated 3,000 tonnes of weapon-grades uranium and plutonium that can fall in the hands of international terrorists or so-called "rogue states" with nuclear ambitions. This amount of fissile material is enough to make thousands of bombs. But it is not all in secure storage — particularly not in Russia and other former Soviet states. In addition to dangers of stolen fissile material, attacked nuclear facilities by terrorists could release catastrophic amounts of radiation.

In some European states (such as Germany), civilian nuclear power programmes will be given up in one or two decades due to high costs, fears of radiation, and

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1 See in detail Joseph Cirincione/Jon B. Wolfsthal/Miriam Rajkumar, "Deadly Arsenals. Tracking Weapons of Mass Destruction" (Washington D.C.: Carnegie Endowment for International Peace, 2002).

2 See OECD/IEA, "World Energy Outlook 2002" (Paris 2002: OECD/IEA, 2002), here p. 128.

unresolved problems in nuclear waste storage.[3] If those nuclear programmes will end, it also will reduce at least the amount fissile material in Europe as well as the infrastructure as a potential targets for international terrorist groups. But at the same time, it may also create new problems for Europe's energy security. While the EU's dependence on energy imports (mainly oil and gas) fell from 60 percent of energy consumption in 1973 to 50 percent in 1999, the present strategic trends indicate the worrying prospect that this dependence may rise again to 70 percent by 2030 as Europe increasingly rejects indigenous coal and nuclear power.[4]

Meanwhile, the prospect of a widespread climate change resulting from an increase in greenhouse gas (GHG) concentrations in the atmosphere has become a major global concern. Against the background that global energy demand may rise dramatically in the 21st century and that nuclear power produces virtually non GHG emissions, it could, therefore, be in important energy source of future strategies to reduce GHG emissions.[5] Hence it can also help to strengthen Europe's and the global energy security by diversifying the energy mix and reducing high dependencies from fossil energy sources (i.e. oil and gas) imports from highly unstable regions (both politically and socio-economically), particularly the Middle East/Persian Gulf and Central Asia/Caspian Basin.

In 1999, nuclear energy supplied more than one sixth of global electricity and a substantial 30 percent of electricity in Europe. But in Eastern Europe and the Newly Independent States (NIS) of the Former Soviet Union, most nuclear power plants have already operated for more than half of their original design lifetimes. That is one of the reasons why Russia and other NIS will build new nuclear power stations in the next decades.

In other parts of the world such as in Russia and Asia, nuclear power programmes will either increase or initiated for the very first time in their countries. This may increase additional dangerous dimensions for the global security of the nuclear infrastructure and safe storage of fissile material. If may also offer new possibilities for nuclear ambitions of those countries. But at the same time it can also help to strengthen Europe's and the global energy security by diversifying the energy mix and reducing high dependencies from fossil energy sources (i.e. oil and gas) imports from highly unstable regions (both politically and socio-economically), particularly the Middle East/Persian Gulf and Central Asia/Caspian Basin.

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3 See John V. Mitchell/Peter Beck/Michael Grubb, "The New Geopolitics of Energy" (London: Royal Institute of International Affairs/Energy and Environmental Programme, 1996), pp. 125 ff.; Peter Beck/Malcolm Grimston, "Future of Nuclear Energy – Powerful Issues", *The World Today*, January 2001, pp. 25-27 and Roland Eggleston, "Germany: Plan to End Nuclear Power Raises Some Questions", RFE/RL Analyses, 16 June 2000.

4 See European Commission (Ed.), "Green Paper. Towards a European Strategy for the Security of Energy Supply", Luxembourg, November 2000 (COM(2000)769 final).

5 See Bob van der Zaan, "Nuclear Power and Global Warming", *Survival*, Autumn 2000, pp. 61-71 and Richard Rhodes/Dennis Beller, "The Need for Nuclear Power", *Foreign Affairs*, January-February 2000, pp. 30-44.

Against this ambivalent background of present strategic trends, I will give an overview of the contradicting developments in regard to the global use of the civilian nuclear energy. Thereby, I will pay particular attention to the nuclear programmes in Russia and those in North- and Southeast Asia where the civilian use of nuclear energy will be expanded in the mid-term future. In this light, I will also discuss some of the potential nuclear proliferation threats and dangers linked with the civilian nuclear programmes as well as the security aspects in the context of international terrorism and weapons of mass destruction (WMD).

Civilian Use of Nuclear Energy World-wide and in Europe

At present, 438 nuclear power plants are in operation around the world and additional 32 are being build — particularly in Asia and Eastern Europe. In Western Europe, around 150 nuclear power plants are producing approximately 30 percent of their electricity, whereas in the United States 188 nuclear reactors are providing 20 percent and in Canada 12 percent of their national electricity demand. The expansion of the European programmes of the civilian nuclear energy use followed the sharp increase in international oil and natural prices in 1973 which caused a thorough rethinking in the national energy strategies of the European states. In Western Europe, however, five of eight EU-states which have nuclear programmes, have declared a moratorium for the future use of nuclear energy. Only France (covering 79% of its electricity demand by nuclear energy), Great Britain (25%) and Finland have no intention to give up their civilian nuclear power programmes.[6] Germany (which produces 32% of its electricity by nuclear power) has pronounced to end its nuclear programmes in the year 2021. But whether renewable energy sources will be able to substitute the electricity generated today by nuclear power is highly uncertain.[7] According to the newest "World Energy Outlook 2002" of the OECD/IEA, for instance, renewable energy will play a growing role in the world's primary energy mix (and with non-hydro renewables growing faster than any other primary energy source), fossil fuels will remain the primary sources of global energy in the mid-term perspective. They will make up more than 90 percent of the increase in the global energy demand, rising from 75 million barrel per day (mb/d) to 120 mb/d in 2030.[8]

Presently, renewable energy sources are generating only 2-3 percent of its energy consumption in Germany (with water power almost 5%), almost 7 percent in the United States and 8 percent world-wide. Even many optimistic scenarios of the rising global energy consumption assume that these renewable energy sources may be able to provide a greater part of the energy and electricity generation up to 30-50 percent

6 See Breffni O'Rourke, "Finland, Bucking Energy Trends, Calls for More Nuclear Power", *RFE/RL Research Analysis*, 14 March 2002.

7 See also Stanley R. Bull/Lynn L.Billman, "Renewable Energy: Ready to Meet its Promise?", *The Washington Quarterly*, Winter 2000, pp. 229-244.

8 See OECD/IEA, "World Energy Outlook 2002", p. 27 f.

only *after* the year of 2030 — despite the forecast that it will grow faster than any other primary energy source, at an average rate of 3,3 percent annually until then.[9]

Nonetheless, Germany (with 19 nuclear power plants), Sweden (12 nuclear power stations), Belgium (7 nuclear reactors), Switzerland (5 nuclear power plants) and Belgium (7 reactors until 2025) as the latest EU state have declared to phase out their civilian use, whereas the United States, France (59 nuclear reactors), Japan (53), Great Britain 35 and Russia (29) will maintain their present civilian nuclear reactors or even expand the nuclear energy. Austria has suspended electricity imports from the Czech Republic to protest against the Temelin plant which produces one-fifth of the Czech Republic's energy demands. In general, the EU depends upon nuclear energy to generate 14 percent of its electricity power. Its gradual abandonment can leave Europe chronically short of energy and electricity. If renewable energy will not be able to substitute nuclear energy when the nuclear power reactors are phase out until 2021 in Germany and other states, Europe will become even more dependent on oil and gas imports in the future than today because coal plants face similar environmental pressure as Europe implements the Kyoto Protocol.[10] Those oil and imports will come primarily from Russia, the Middle East and Central Asia – the latter two regions are highly unstable both politically as well socio-economically. The other alternative option for Germany, for instance, is to import electricity from nuclear plants in France, the Czech Republic or Ukraine and Russia as probably the cheapest supplier. Such a development reveals one of the inherent contradictions of a national based decision to phase out the use of civilian nuclear energy: Germany, Sweden and other beginning to close the most secure nuclear plants, whereas in the future they might be forced to import nuclear electricity from the most unsafe nuclear power plants existing in Europe.

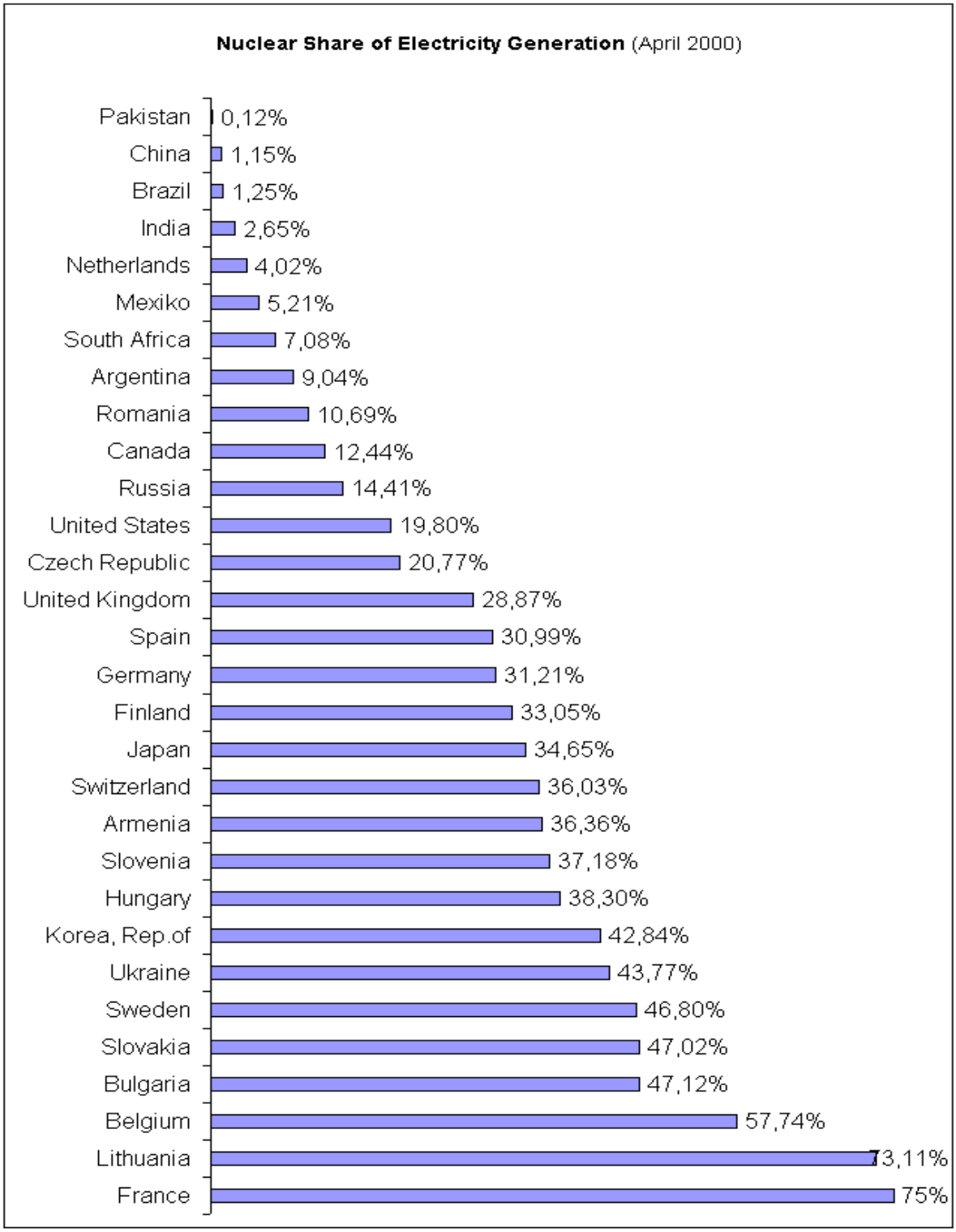
Against this background, the main conclusion of the so-called "Green Paper" of the EU", adopted on 29 November 2000 as the first major review of energy policy since the 1970s, is that the EU can only meet its climate change goals and avoid risky dependence on foreign oil and gas imports (especially not from "rogue states" like Iraq and Iran) if it takes drastic measures to curb energy consumption while keeping the nuclear option open. The "Green Paper" reminds European politicians, for instance, that avoiding 300m tonnes of carbon every year is equivalent to the emissions of 75 million cars, by using nuclear energy.[11]

9 See OECD/IEA, "World Energy Outlook 2002" (Paris: OECD/IEA, 2002), p. 27 f.; Winand von Petersdorff, FAZ, 14.5.2002, p. 3 (English edition of the IHT); see also IAEA, "Climate Change and Nuclear Power", Vienna 2000, here p. 2 and Tony Weslowsky, "EU: Energy Deregulation May Be Bad News for Nuclear Power", *RFE/RL Analyses*, 1 November 2000.

10 See also Andrew Taylor, *Financial Times*, 27 June 2001, p. 8.

11 See European Commission (Ed.), "Green Paper. Towards a European Strategy for the Security of Energy Supply", adopted on 29 November 2000, COM (2000) 769 final, Brussels 2001.

Table 1 - *Nuclear Share of Electricity Generation (April 2000)*



Source: IAEA, "Climate Change and Nuclear Power", Vienna 2000.

Whilst the *EU Commission* hoped to initiate new debates on its energy security, the effect of the "Green Paper" in regard to public debates in Germany and other European states with a strong anti-nuclear sentiment has been marginal thus far. Sweden has closed the first of 12 plants but seems under some circumstances willing to extend the life of others if necessary and, at the same time, has invested in the German nuclear industry. Italy, which had three operating plants, has closed them and depends more than ever on imported oil for most of its energy needs. Austria has renounced nuclear energy, but is surrounded by countries that rely on it. Only Finland is building a new nuclear power plant (the fifth) and has recently called on the EU to consider more emphasis on nuclear power plants. This pro-nuclear attitude is explained by the fact that the Scandinavian country has a relatively tough target to achieve under the *Kyoto-Protocol* and has a lot of intensive energy-consuming industries (such as paper and pulp). It is therefore very sensitive to energy prices on order to being competitive enough on the future world market. France, which is more dependent on nuclear power than any nation in the world, will have to decide in the next years whether to replace its current generation of 59 nuclear plants and where to store highly dangerous long-term nuclear wastes.[12]

Meanwhile, nuclear power is also gaining new proponents in the US which is extending the service life of some of its 104 nuclear power plants. After the recent electricity crisis in California in 2001, nearly 60 percent of California's residents, who have traditionally been sceptical of nuclear power, are now in favour of new plants.[13] In general, around the world, attitudes were beginning to shift already before September 11, 2001[14]. In Eastern Europe and the Newly Independent States, for instance, there are operating 68 nuclear power plants. And in fact, the issue of nuclear safety in the Central and Eastern European countries waiting to join the EU is a major factor in the enlargement debate. Thus, for instance, the EU has demanded a timetable for the final closure of the Chernobyl-style plant.[15] But for the Lithuanian government it is impossible to close the nuclear power plant by the suggested date of 2009.[16]

In the Middle East, South Asia and the Far East, there are currently 84 nuclear reactors. A further expansion of the nuclear energy use is planned especially in Asia — in particular in China, India, Japan, the Republic of Korea and even in some

12 See Joel Blocker, "France: Nuclear Power Meets Energy Needs and Provides Export Income", *RFE/RL Analyses*, 22 February 1999 and Catherine Field, IHT, 26 August 2002, p. 12.

13 See also John J. Fialka, *Wall Street Journal Europe*, 27 June 2001, p. 3; Julie Moffet, "United States: Nuclear Power Undergoing a Revival", *RFE/RL Analyses*, 22 February 1999 and Wolfgang W. Merkel, *Die Welt*, 2 May 2002, p. 31.

14 See also Barry James, *IHT*, 15 June 2000, p. 7; James Taylor, *Financial Times*, 27 June 2001, p. 8, and Winand von Petersdorff, *FAZ* (English-edition for the IHT), 14 May 2002, p. 3.

15 See also Ron Synovitz, "The East: EU Ties Membership to Improved Nuclear Safety", *RFE/RL Analyses*, 22 February 1999.

16 See also Valentinas Mite, "Lithuania: EU Urges Closure of Ignalina Nuclear Plant", *RFE/RL Analyses*, 3 April 2002.

of the ASEAN states. In contrast to their expansion plans, Latin America and Africa account nowadays for less than 2 percent of global nuclear electricity capacity.

Table 2 - *World Electricity Balance 2000-2030*

	2000	2010	2020	2030	Average annual growth 2000-2030 (%)
Gross generation (TWh)	**15,391**	**20,037**	**25,578**	**31,524**	**2.4**
Coal	5,989	7,143	9,075	11,590	2.2
Oil	1,241	1,348	1,371	1,326	0.2
Gas	2,676	4,947	7,696	9,923	4.5
Hydrogen-fuel cells	0	0	15	349	-
Nuclear	**2,586**	**2,889**	**2,758**	**2,697**	**0.1**
Hydro	2,650	3,188	3,800	4,259	1.6
Other renewables	249	521	863	1,381	5.9
Own use and losses (Mtoe)	235	304	388	476	2.4
Total final consumption (Mtoe)	1,088	1,419	1,812	2,235	2.4
Industry	458	581	729	879	2.2
Residential	305	408	532	674	2.7
Services	256	341	440	548	2.6
Other*	68	89	111	133	2.3

* Includes transport, agriculture and non-specific uses of electricity.
Source: OECD/IEA, "World Energy Outlook 2002" (Paris 2002: OECD/IEA, 2002), here p. 124.

In general, if the world-wide trends (not just in Asia and the former Soviet Union) will not change substantially, the role of nuclear power on the global scale will decline in the next decades. It is expected that nuclear production will peak at the end of this decade at around 7 percent of its share of world primary demand and then decline gradually to 5 percent by 2030. But as the new "World Energy Outlook 2002" by the OECD/IEA has pointed out, the prospects for nuclear power are in particular very uncertain given the new ambivalent trends and divided opinions in the United States and Europe.[17]

In the light of the anti-nuclear sentiments in Europe, it remains uncertain in the politically most stable region in the world whether the nuclear energy will contribute to save the world from greenhouse effect and global climate change. Ironically, the civilian nuclear power programmes are particular strong in those states and regions which are seen politically as rather unstable. In the light of September 11, 2001, however, the world-wide security and safety of nuclear power plants and other nuclear related infrastructure has acquired new dimensions for the international security policy by undermining further the future of civilian nuclear power stations on a global scale. But as the same time, nuclear power is increasingly seen as a national energy source that strengthens the diversification of the national energy supply by making the Western and Asian countries less dependable from politically highly unstable oil and gas export regions such as the Middle East/Persian Gulf and Central Asia/Caspian Basin.

17 See OECD/IEA, "World Energy Outlook 2002", here p. 27 and 128.

Russia's Nuclear Power Programmes

Russia has currently 29 nuclear reactors which generate 11 percent of the country's electricity power. Concern over the waste in the Arctic as well as lingering doubt over the safety of nuclear power after the 1986 Chernobyl accident in Ukraine, many Russians are still wary about new nuclear power plant construction.[18]

In spite of this continued concern over the safety of nuclear power, Russia is planning several new nuclear projects. Construction of reactors at the Kyaltin and Kursk nuclear power plants and at the Rostov and Yuzhno-Ural nuclear plants will be finished by the year 2005 according to official plans. It has also unveiled plans to build a new plant at Sosnovy Bor near St. Petersburg. The latter plant is expected also to be used not just for producing electricity, but also in the decommissioning of old nuclear submarine reactors now left unused in Russia's part of the Arctic Sea. Russia will more than double its capacity to generate nuclear power of the next 20 years and to begin construction of new reactors with enhanced safety features. Russian experts also hope that they will export increasingly nuclear power to Germany and Western Europe after they announced to phase out their civilian use of nuclear energy.[19] A major continuing problem for the Russian nuclear power industry is the failure of its customers to pay for electricity, which has contributed to a lack of resources for maintenance, spare parts, and salaries.

Russia's Ministry of Atomic Energy also intends to construct floating nuclear power plants in remote areas of Russian Far North and East provinces. These small power plants shall provide electricity and heat to regions with underdeveloped infrastructure or to sites of big construction projects. Those plants can be moved to areas struck by natural disasters or other emergencies. This one reason why Russian officials see in their floating nuclear power plants significant export chances. But given that these plants will be powered by reactors running on highly enriched uranium (HEU), exports to foreign countries will increase the global proliferation of this sensitive fissile material because HEU can be easier converted to weapon-grade material than low enriched fuels. Sceptics are also quote physical protection measures, issues of ownership and liability as further problems. These potential "waterborne Chernobyls", which easily could also be raided by terrorists, are also posing many risks to the fragile Artic environment and public health — especially if extra radioactive waste will be dumped into the sea or on shore nearby. In these regions, Russian investigators found, for instance, virtually no controls over 85 radio-thermal generators (delivering power to remote locations, such as a military base or a cliff-side beacon) installed in the 1960s and 1970s.[20]

18 See also Anthony Wesolowsky, "Russia: Nuclear Power Plans Move Forward", *RFE/RL Analyses*, 22 February 1999 and "Russia's Nuclear Future", Stratfor.Com, 8 December 2000.

19 See also Susan B. Glaser, *Washington Post*, 6 June 2001 (Internet-version) and Patrick E. Tyler, *IHT*, 28 May 2001, p. 5.

20 See Anthony Wesolowsky, "Russia: Nuclear Power Plans Move Forward"; "Russia's Nuclear Future", Judith Matloff, *Christian Science Monitor*, 17 February 2000 (Internet-version) and Eduard

Russia has also unveiled a controversial plan — that 90 percent of Russians oppose in public opinion polls — to reprocess spent fuel from countries outside the former Communist block to raise hard currency. Under the plan, any profit from reprocessing waste would be used to clean up plants and improve safety. The price for reprocessing would be significantly less than that charged by French and British companies, which handle most of the reprocessing in Western Europe. But not only Russia's environmentalists remain sceptical about the use of those funds. On the other hand, adding foreign spent fuel to the existing Russian stockpile might not be as so bas as the alternative: a nuclear waste storage crisis and no resources to deal with it. According to energy officials, taking in spent fuel from abroad is the only commercially sensible way to proceed. It is not clear thus far whether Russia intends to re-cycle the fuel for use in nuclear power stations or simply store it. But the United States has opposed those reprocessing spent fuel because the process attracts plutonium that could be used in nuclear weapons. For US experts it is simply "crazy to take more nuclear material into a country still unable to deal with nuclear waste it already has".[21] As the British expert Mark Galeotti has pointedly argued: "Russia's slow progress in securing its stockpiles of nuclear weapons and components is making the country one of the main potential sources of the raw materials for future 'megaterrorism'.[22] The liberal Russian lawmaker Sergei Metrokhin (from the *Yabloko party*) confirmed the country's safety standards as "non-existent" in February 2002 after he encountered no problems entering a secret nuclear waste dump in Krasnoyarsk region (central Siberia) despite having no authorisation to be there. He warned that any terrorist can repeat his trick.[23]

As the Bush Administration has officially declared, Russia's present nuclear stockpile is one of the most dangerous national security threats the United States is facing today. It includes more than 40,000 nuclear weapons, more than 1,000 tonnes of excess HEU enough to produce 20,000 nuclear weapons and vast quantities of material for biological and chemical warfare (40,000 tonnes). Russia has already committed itself to shipping 150,000 tonnes of low-enriched uranium (LEU) derived from 500 tonnes of HEU from dismantled warheads to the United States under a 20-year agreement signed in 1993.[24]

Fesko, "Russian Floating Nuclear Reactors – Proliferation Risks", Monterey Institute of International Studies, 24 June 2002 (via Internet: - http://cns.miis.edu/pubs/week/020624.htm).

21 Quoted following Susan B. Glasser, *IHT*, 13 February 2001, p. 4.

22 Mark Galleotti, "Russia's 'Arsenal of Megaterrorism", *Jane's Intelligence Review*, September 2002, pp. 48-49.

23 Alexander Nikolayev, *Rossiya*, 5 March 2002, p. 4 and Francesca Mereu, "Russia: Nuclear Security System Comes under Question", *RFE/RL Analyses*, 18 February 2002.

24 See also "Managing the Global Nuclear Materials Threat. Executive Summary. A Report of the CSIS Project on Global Nuclear Materials Management", Washington D.C., January 2000; "Cooperative Science and Non-Proliferation. The ISTC/STCU Experiment", *Strategic Comments* (ed. by the IISS, London), August 2002; Jon B. Wolfsthal/Tom Z. Collina, "Nuclear Terrorism and Warhead Control in Russia", *Survival*, Summer 2002, pp. 71-83; "Reshaping U.S.-Russian Threat Reduction. New Approaches for the Second Decade". Findings Developed by a Joint Working Group (Washington D.C.: Carnegie Endowment for International Peace and the Russian-American

The recent secret joint US-Russian operation of removing weapons-grade uranium (45 kilograms of high-quality Yugoslav uranium enough to make as many as three nuclear bombs) from an ageing reactor near Belgrade as part of two dozen reactors in 16 countries as subjects of similar missions has confirmed this US threat perception.[25] It was also the prime motive that the G8 meeting has decided to allocate US$20 billion over the next decade for the safe disposal of weapon's grade plutonium stocks in Russia and the rest of the FSU. Not so much the theft or disappearance of nuclear warheads and "suitcase bombs" pose the greatest danger, but rather the possibility of nuclear materials — even of relatively low yield — ending up in "dirty bombs" seems a more likely scenario in the near future[26]. Thus Chechen rebels caused panic and chaos by planting — but not detonating — a dirty bomb using dynamite and Caesium 137 in Moscow's Izmailovo Park in 1996.

The Russian Atomic lobby tries also to sell Russian reactors abroad such finishing several reactors in Iran, two others in China and building two reactors in India. As we all know, the United States has expressed concerns specifically about finishing the *Bushehr* reactors which could aid Iran in developing nuclear weapons. Since 1995, Russia's nuclear ties with Iran have been expanded when Moscow signed a contract with Teheran to complete the Bushehr nuclear power station that Germany companies abandoned with the beginning of the "Islamic Revolution" in 1979. But conservative politicians and hard-liners in the Russian media have dismissed the US criticism by arguing that their statements are part of an effort to shut Moscow out of the nuclear power game.[27] The Clinton-Administration was in particular worried about Russian plans to sell expensive laser equipment to Iran which is suited to producing fissionable material for bombs. In its view, it was another indicator that Iran with one of the largest oil and gas resources in the world wants to make nuclear weapons rather than just to develop commercial plants. Iran, by contrast, has denied repeatedly to pursue a nuclear weapons programme and has put the Bushehr plant under the international agency's rules and safeguards.[28] In June 2001, the Russian Foreign Ministry even declared to share some nuclear technology with other countries under the aegis of the IAEA which can fasten the construction of new nuclear power plants around the world that would depend on Russia for nuclear fuel and waste disposal. The offer includes to share the knowledge of fast "breeders" and

Nuclear Security Advisory Council, November 2002), and Al J. Venter, "Soviet Nuclear Legacy Poses Deadly Threat", *Jane's Intelligence Review*, October 1999, pp. 12-16.

25 See John Warrick, *IHT*, 26 August 2002, p. 3; idem, ibid., 24-25 August 2002, pp. 1 and 5 and Mark Huband/James Lamont, *Financial Times*, 26 September 2002, p. 4. In context see also Lale Sabrihomuglu, "Turkey Detects Nuclear Material Trafficking", *Jane's Intelligence Review*, August 2002, pp. 30-32. Recently, the police in Tanzania have also seized 110kg of suspected uranium and arrested five people – see BBC News-World Edition, 14 November 2002.

26 See Svetlana Babayeva, *Izvestiya* (Moscow), 29 June 2002, p. 5; *IHT*, 28 June 2002, pp. 1 and 4; Nicolas George, *Financial Times*, 29-30 June 2002, p. 3; Peter Slevin, *Washington Post*, 25 June 2002, p. A15.

27 See also Peter Baker, *International Herald Tribune* (IHT), 23 October 2002, p. 5.

28 See Judith Miller, *New York Times*, 19. September 2000 (Internet-edition).

"closed fuel cycles"[29]. In October 2001, few weeks after the terrorist attack in New York and Washington, Russia announced a new military accord with Iran to deliver conventional weapon systems, including combat aircraft, missiles and other weapons, reaching $300 million in annual sales over the next five years and to deliver next month the first of two nuclear reactors for a 1,000megawatt power station at Bushehr.[30] Since that time, Iran has become the third largest arms customer of Russia (after China and India), including of sensitive technologies, equipment, and components for ballistic and a potential nuclear-weapons development. In July 2002, Russia further expanded its nuclear cooperation with Iran buy outlining plans to build three more reactors at the Bushehr site and two additional reactors (at a cost of together $8,5 billion) at a new nuclear power station at Ahwaz, a city 60 miles from its border with Iraq. These new plans openly contradicted earlier announced statements that Russia's nuclear cooperation with Teheran to develop a nuclear power industry would end with the Bushehr-project. At the same time, the Putin -government tried to defuse US concerns by insisting towards Teheran that Iran has to return the plutonium produced as a byproduct of nuclear power generations to prevent it from being used in weapons and has pressed Iran to allow extensive IAEA inspections of the plants.[31] Indeed, in the following month Iran signed an agreement with Iran guaranteeing the return of spent fuel from the Bushehr reactor.[32] However, it is not clear whether this agreement also covers the two newly build nuclear power reactors at Ahwaz. Finally, in February this year, Iran announced to have begun mining uranium at Savand (200 km from the city of Yazd in central Iran) and planning to build two plants in the city of Isfahan (central Iran) and Kashan (south of Teheran) for processing the uranium to provide fuel for generating electricity. As sources from Iranian dissident groups indicate, the nuclear fuel production plant at Kashan includes two large spaces that are 25 feet underground![33] Meanwhile, even Chris Patten, the EU's commissioner for external relations, has also accused Iran seeking to acquire "non-conventional weapons"[34] though the EU is interested to build closer relations with Iran.

In addition to the regular nuclear power plants, Russia and particular its capital Moscow have nearly 40-45 nuclear reactors functioning at various scientific research institutes. Many of these reactors are located in residential sections of Moscow which has raised concerns about the potential risk posed by ageing equipment and spent

29 See "Russia: Offer to Share Nuclear Energy Technology May Unseat U.S. Dominance in Industry", Stratfor.Com, 7 June 2001 and Vladimir Isachenkov, Associated Press, 17 December 2001.
30 See Michael Wines, ibid., 3 October 2001.
31 See Steven Lee Myers, *New York Times*, 26 July 2002 (Internet-edition) and Manfred Quiring, *Die Welt*, 1 August 2002, p. 5.
32 See Michael Wines, ibid., 22 August 2002 (Internet-edition).
33 See Nazila Fathi, ibid., 9 February 2003 (Internet-edition), *Neue Zuericher Zeitung* (NZZ), 11 February 2003, p. 2 and *Frankfurter Zeitung* (FAZ), 11 February 2003, p. 6 and NTI-Global Security Newswire, 15 August 2002.
34 See Nazila Fathi, ibid.

fuel storage.[35] In general, the security and safety of many military facilities related to nuclear weapons is much better than civilian facilities with fissile material.

Outside of Russia, even more dangers exist. With no other help available, scientists in the Georgian town Mtskheta recalled that they guarded the reactor with sticks and garden rakes, whilst Abkhaz separatists overran the reactor in Sukhumi and then apparently took two kilogramme of HEU. Until today, nobody knows what happened to it.[36] In Armenia, the government has recently decided to reactivate the Metsamor nuclear plant (35 km west of the capital Yerevan), which provides 40 percent of the country's annual electricity production, but without receiving fresh nuclear fuel after lasting but unsuccessful negotiations with Russia. But in contrast to the EU and its safety as well as security concerns of the Armenian nuclear power plant located in a seismically active zone and being vulnerable to technical problems and serious accidents, Russia has no interest that the Metsamor nuclear power plant will be shut down – neither for financial nor for foreign policy reasons.[37]

Nuclear Power Programmes in Asia — The Rising Security Dimension

> "Nuclear trends in Asia are moving in the opposite direction. Asia contains the only nuclear weapon-state that is increasing its arsenal of nuclear and ballistic missiles (China); the two states which have recently chosen to declare their nuclear capabilities (India and Pakistan); the third (and now unique) 'threshold countries' (Israel); and the two countries found guilty of violating their non-proliferation commitments (Iraq and North Korea). In addition, South Korea and Taiwan ran military nuclear programmes in the 1960s and 1970s; Iran has long been suspected of activities prohibited under the NPT; and Japan is recognised as having a latent capability to produce nuclear weapons quickly. Lastly, the United States and Russia are major Asian powers as well. Asia therefore comprises more nuclear powers or nuclear-capable states than any other region in the world."
> (Therèse Delpech, Director of Policy Planning at the Atomic Energy Commission, Paris, in an analysis of December 1998[38])

Although the radioactive leak from the Tokaimura uranium-processing plant 120 km north-east of Tokyo in 1999 was Japan's and Asia's worst nuclear accident (and the first in Asia to reach level four on the International Nuclear Event Scale) and simultaneously the world's worst since the 1986 Chernobyl explosion, Asia's enthusiasm for nuclear power has not been stopped. Every plant that began construction in 1998 was in Asia — two in China and one in Japan. Of the four new

35 See Valentinas Mite, "Russia: Nuclear Reactors Based in Moscow Cause Concern and Fears", *RFE/RL Analyses*, 17 June 2002.
36 See Joby Warrick, *IHT*, 21 May 2002, pp. 1 and 3.
37 See Emil Danielyan, "Armenia: Yerevan to Relaunch Vital Nuclear Plant without Fresh Russian Fuel", *RFE/RL-Analyses*, 16 January 2003.
38 Therèse Delpech, "Nuclear Weapons and the 'New World Order': Early Warning from Asia?", *Survival*, Winter 1998-99, pp. 57-76.

nuclear-power plants commissioned around the world in 1998, three were in South Korea.[39] Seoul has indeed one of the most ambitious nuclear energy programmes in the region and plans to double its present 15 nuclear power plants until 2015. In contrast to South Korea, however, Taiwan's President Chen-Shui-bian is a staunch opponent of nuclear power and has announced to overhaul its national energy policy[40] in his country that is one of the least energy-efficient economies in the world.

Statistics are often misleading as the case of the PR China shows. In 2001, the nuclear capacity for the most heavily populated country on Earth (more than one fifth of the present mankind) was slightly less than that of Finland. But at the same time, it is the biggest growth market for nuclear power. No other country in Asia or elsewhere in the world is expected to growth as fast as China. Several nuclear projects are under construction, with the involvement of Russian, French, and Canadian firms.

The first generation unit of the Lingao nuclear power plant in Guangdong province began commercial operation in May 2002, with a capacity of 1-GW. The second 1 GW generating unit will begin operating in March 2003 according to the official plan. Furthermore, an additional 600-MW generating unit at the Qinshan nuclear power plant in Zheijang province began operation in February this year, and another 600-MW unit at the same site is scheduled to begin delivering electricity in late 2002.[41]

Table 3 - *Total Primary Energy Demand in China (Mtoe)*

	1971	**2000**	**2010**	**2030**	**Average Annual Growth 2000-2030 (%)**
Coal	192	659	854	1,278	2.2
Oil	43	236	336	578	3.0
Gas	3	30	57	151	5.5
Nuclear	0	4	23	63	9.3
Hydro	3	19	29	54	3.5
Other renewables	0	1	4	9	6.8
Total primary energy demand	**241**	**950**	**1,302**	**2,133**	**2.7**

Source: OECD/IEA, "World Energy Outlook 2002" (Paris: OECD/IEA, 2002), here p. 249.

39 See Chester Dawn u.a., "Nuclear Alert for Asia", in *Far Eastern Economic Review* (FEER), 14 October 1999, p. 18 f.

40 See Julian Baum, "No to Nuclear", in *FEER*, 2 November 2000, p. 42.

41 See also EIA, "China – Country Analysis Briefs", June 2002 (via Internet – http:/www.eia.doe.gov/emeu/cabs/china.html).

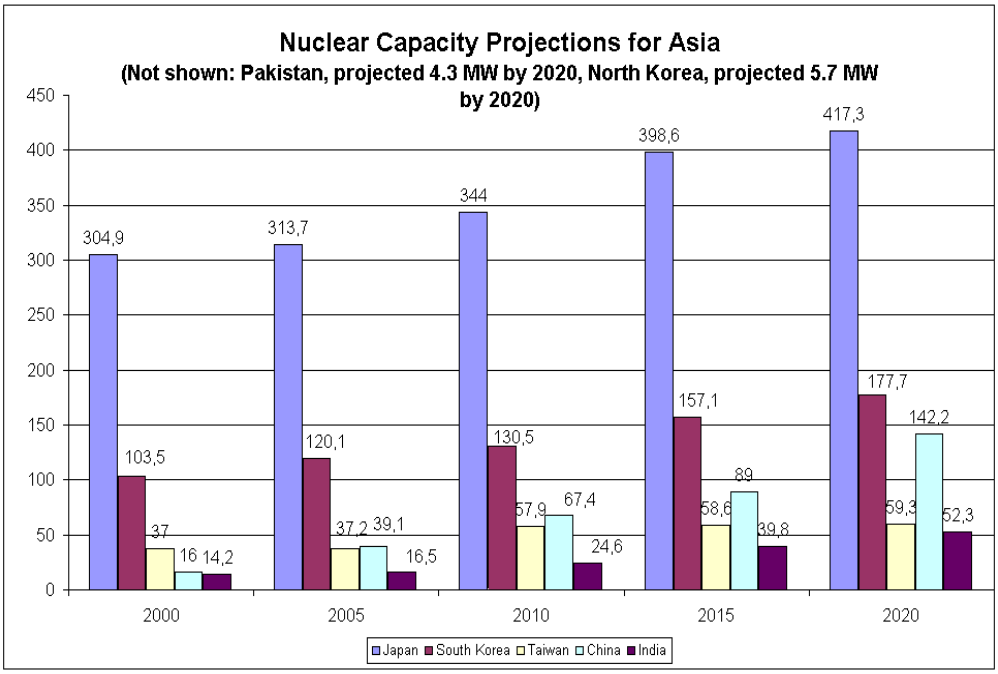
Table 4 - *Electricity Generation Mix in China (TWh)*

	1971	2000	2010	2020	2030
Coal	98	1,081	1,723	2,509	3,503
Oil	16	46	51	53	54
Gas	0	19	74	209	349
Nuclear	0	17	90	163	242
Hydro	30	222	333	511	622
Other renewables	0	2	10	16	42
Total	**144**	**1,387**	**2,282**	**3,461**	**4,813**

Source: OECD/IEA, "World Energy Outlook 2002" (Paris: OECD/IEA, 2002), here p. 249.

At present, China has a capacity of 2GW, which is just generating 1 percent of its electricity in the year 2000 due to the long lead times and high capital cost of nuclear plants.[42] Despite the expansion programmes of China's civilian nuclear power programmes from present six nuclear power plants to 10 in the year 2010 and 16-18 in 2025[43], the planned growth of nuclear energy to 11 GW in 2010, 21 GW in 2020, and 31 GW in 2030 *vis-à-vis* to the anticipated national energy consumption will grow from 1.5 percent in the mid of the 1990s to just 4-6 percent in 2020-2030.[44]

Table 5 - *Nuclear Capacity Projections for Asia 2000-2020*



Source: EIA – http://www.eia.doe.gov/cneaf/nuclear/page/nuc_reactors/china/china. html.

42 See OECD/IEA, "World Energy Outlook 2002", p. 264.

43 See Simon Rippon, "China: Ready for More Nuclear Power", *Nuclear News*, June 1995, pp. 32-33 (via Internet – http://www.nti.org/db.nuclear/1995/n9513965.htm).

44 See also *China Daily*, 7 January 2002 (Internet-version); OECD/IEA, "World Energy Outlook 2002", p. 264 and in context also Frank Umbach, "China's Energy Policy", in *Transatlantic Internationale Politik 2* (Summer) /2001, pp. 85-89.

Moreover, China has now become one of seven countries that can design, build and manufacture nuclear power plants.[45] Reportedly at the end of last October, for instance, China is now offering assistance and support to build Pakistan's third nuclear power plant to overcome its energy shortage.[46] But at the same time, China's centralised political system has been undermined by mounting corruption and an ideological vacuum in the wake of the successful "socialist market reforms" during the last decade. Hence the capacity of "bad actors" to operate more freely has also grown in China.

Given South Korea's and Taiwan's past nuclear weapon programmes which had been stopped in the 1970s and the beginning of 1980s following US pressure, the lingering historic distrust, suspicion, rivalry in East Asia has fuelled the regional arms race with an increasing access to modern weapons of mass destruction, particularly ballistic missiles.[47] China's increasing ballistic and short-range missile arsenal at the Taiwan Strait has not only increased threat perceptions in Taiwan, but also in Japan and India with its own rising numbers of ballistic missiles and nuclear weapons. Last June, the chief secretary of the Japanese cabinet, Yasuo Fukuda, said that Tokyo could review its ban on nuclear weapons if necessary. In April before, Ichiro Ozawa, leader of Japan's second-largest opposition party, caused angry comments from China when he said that Japan could easily make nuclear weapons and surpass China's rising military might.[48]

Table 6 - *Nuclear Ambitions in North- and South Asia (in 1999)*

	Japan	**South Korea**	**India**	**Taiwan**	**China**	**Pakistan**
Number of Reactors under Construction	2	3	4	1	6	1
Number of Reactors in Operation	53	15	10	6	3	1
Nuclear Share of Electricity Generation	36%	41%	3%	25%	1%	1%

Source: Chester Dawson et. al., "Nuclear Alert for Asia", in: *FEER*, October 14, 1999, pp. 18-19 (19).

Indeed, of 17 countries with nuclear weapons or weapon programmes world-wide, seven are in the Asia-Pacific region; of the 28 with missile programmes, 16 are in the

45 See *Beijing Review*, 26 February 1998.

46 See *Hindustan Times*, 28 October 2002 (Internet-version).

47 See also F. Umbach, "Nuclear Proliferation Challenges in East Asia and Prospects for Cooperation - A View from Europe", in: Kurt W. Radtke/Raymond Feddema (Eds.), "Comprehensive Security in Asia. Views from Asia and the West on a Changing Security Environment and Their Implications for Europe", Leiden-Boston-Köln 2000, pp. 66-133, and idem, "Strategic Trends of Global Denuclearization and Nuclearization - Implications for Japan's Security Policies, Regional Stability and the TMD-Debate in East Asia", *Hiroshima Peace Science*, No. 27, April 2001, pp. 63-118.

48 See Michael Richardson, *IHT*, 6 June 2002, p. 5; David Kruger, "Never Say Nuclear", *FEER*, 4 July 2002, pp. 16-17; Brad Glosserman/Yumiko Nakagawa, "Trust Japanese Democracy", *PacNet-Newsletters* (ed. by the CSIS-Hawaii, Honolulu), No. 26, 28 June 2002 and Robyn Lim, *IHT*, 13 June 2002, p. 8.

region; of the 16 with chemical weapons programmes, 10 are in the region, and of the 13 with biological weapons programmes, eight are in the region and more than 50 percent of potential proliferators are in the same according to the South Korean Defence Ministry.

At present, China has the largest nuclear weapon programme as it is developing two ICBMs (both having a MIRV capability), a SLBM (also with a potential MIRV capability), a strategic nuclear submarine and air-launched cruise missiles (with a potential warhead configuration). Theoretically, China as the only declared nuclear weapons state under NPT in Asia might in the theoretical position to increase its nuclear arsenal from 300 to 600-900 strategic warheads within the next 15 years if is deploying MRV/MIRV-warheads on its new ICBMs and SLBMs. Given the US ballistic missile defence plans and Russia's declared withdrawal from START-II which prohibited MRV/MIRV-warheads on ICBMs[49], it seems now even more likely that China may also opt to MRV/MIRV its new generations of ICBMs and SLBMs. But even regardless of this MRV/MIRV question for China's future strategic nuclear arsenal, China's rising military capabilities are already casting a shadow on the regional security environment and particularly on the future bilateral relationship between Beijing and Tokyo and can so fuel nuclear weapons ambitions in Taiwan and Japan or fasten and expanding those already existing in India.[50]

In addition, the new North Korean crisis after Pyongyang has confessed on October 4, 2002 (the U.S. government made it public on October 16, 2002) to have an ongoing uranium-based nuclear weapons programme has further undermined the global and regional non-proliferation efforts (including the October 1994 Agreed Framework and the KEDO programme for the Korean peninsula), and regimes (such as the NPT) and has questioned again whether the hitherto rather limited inspections of the UN and the IAEA can really prove the existence and non-existence of secret nuclear weapons programmes.[51]

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49 To the background see F. Umbach, "Future Military Reform: Russia's Nuclear and Conventional Forces" (Camberley/Surrey: Conflict Studies Research Centre/Defence Academy of the United Kingdom, D65, August 2002), here p. 19ff.

50 See also F. Umbach, "US and European Assessments of China's Political Intentions, Military Capabilities, Arms Control and Non-Proliferation Policies", *Transatlantic China Workshop* – German/European Expert Group, 9 September 2002 (forthcoming on the German and English web-sites of the DGAP: www.dgap.org), 25 pp.; idem, ''Nuclear Proliferation Challenges in East Asia and Prospects for Cooperation - A View from Europe", pp. 101 ff., and idem, "Strategic Trends of Global Denuclearization and Nuclearization - Implications for Japan's Security Policies, Regional Stability and the TMD-Debate in East Asia", pp. 86 ff.

51 See F. Umbach, "US-Foreign and Security Policy of the Bush-Administration: Unilateralism, Bilateraism, Multilateralism or Minilateralism *vis-à-vis* North Korea and its Nuclear Ambition?", paper presented at the "Asia Pacific Security Forum — 2002 Roundtable on the Asian Pacific Security Environment: Emerging Realities", organized by the Institute for National Policy Research (INPR, Taiwan), The Pacific Forum CSIS (Hawaii,USA), Institute for Strategic and Development Studies (Manila, Philippines) and the Institut Français des Relations Internationales (IFRI, Paris/France) in Hawaii, 9-10 November 2002 (the paper is forthcoming on the web-sites www.inpr.org.tw and www.dgap.org), 14 pp.

Table 7 - *Status of Nuclear Power and Research Reactors in the ASEAN-States*

	Power Reactor	**Research Reactor**
Brunei	-	-
Cambodia	-	-
Indonesia	-	3 units in operation
Laos	-	-
Myanmar	-	-
Philippines	1 unit moth-balled	1 unit under repair
Singapore	-	-
Thailand	-	1 unit in operation, 1 unit in pending construction
Vietnam	-	1 unit in operation

Source original: Malaysian Institute for Nuclear Technology Research (1999).

Source here following: Mohd Zamzam Jaafar, "ASEAN", in Paul B. Stares (Ed.), "Rethinking Energy Security in East Asia", Tokyo-New York 2000, pp. 117-140 (131).

Although the ASEAN countries see themselves in the use of nuclear energy programmes a number of problems and challenges due to the demanding and expensive requirements in terms of developing new infrastructure and facilities as well as training a disciplined and specialised workforce making nuclear energy rather one of the least attractive energy options especially to private-sector companies, nuclear power planning remains attractive and ongoing activity.[52] Thus far, the Philippines is the only ASEAN country to have built a nuclear power plant, albeit it has yet to be commissioned. But Indonesia, Malaysia, Thailand and Vietnam have all built a research reactor or one which is under construction and repair. However, all ASEAN countries are members of the *NPT*, and all except Brunei, Cambodia, and Laos are members of the *IAEA*. Furthermore, all ASEAN members signed the *Treaty on the South East Asia Nuclear Free Zone* on December 1995 and reaffirmed the *Declaration on the Zone of Peace, Freedom and Neutrality* (*ZOPFAN*) signed in 1971.[53]

After dropping a plan in 1997 to build 12 nuclear reactors along the north coast of earthquake-prone Java-island which is one of the most densely populated regions (70% of Indonesia's population of 210 millions) and studded with many active volcanoes, Indonesia has announced in January 2003 to build its first nuclear plant on the Muria Peninsula in central Java, beginning in 2010 and becoming operational in 2015.[54] Given the concerns in regard to the seismically active region of Java, the widespread political turmoil, financial crisis, endemic corruption and communal violence in Indonesia — as the Islamic terrorist bombing on the island of Bali (which was seen until then as one of the very few safe heavens in the country) are not a perfect environment for operating nuclear power plants.

52 See also Michael Roston, "Nuclear Archipelagoes? Secure Nuclear Materials in Southeast Asia", *PacNet-Newsletter*, No. 25, 21 June 2002 and Brad Glosserman, "Solving Asia's Nuclear-Waste Dilemma", *ibid*., No. 24, 15 June 2001.

53 See Mohd Zamzam Jaafar, "ASEAN", in Paul B. Stares (Ed.), "Rethinking Energy Security in East Asia", Tokyo-New York 2000, pp. 117-140.

54 See *CNN*, 7 January 2003 (Internet-edition).

Meanwhile, however, Myanmar has shown a strong interest at nuclear energy programmes. In December 2001, Russia announced that it will sell a nuclear research reactor to Burma.[55] Even in the case that Myanmar may not become a Southeast Asian nuclear rogue state, the movement of radioactive and fissile materials into and out of this military state must be worrying in the light of widespread corruption and the risks of terrorists using improvised nuclear devices and "dirty bombs". But it is questionable whether the military junta has the financial resources or the means to achieve its nuclear goals. But they may favour such an expensive programme because the possession of nuclear weapons can extend the already isolated regime's importance and influence in the region.

Moreover, Vietnam has also announced to expand its civilian programmes to fuel its expanding economy. But at the same time, regional security experts distrust Vietnam that it will use its nuclear weapon programmes just for civilian purposes given its historical enmity with China as the rising potential hegemon in the region. Hence Southeast Asia is in the need of comprehensive procedures for protecting, controlling, and accounting fissile materials (MPC&A) that could be used to build nuclear and "dirty bombs".[56] The ASEAN Declaration on *Joint Action to Counter Terrorism* of 2001 is an important step to enhance security co-operation in the region and to commit its members to the prevention of terrorism, but it has failed to address nuclear risks specifically.

55 See also "Russia-Myanmar Reactor Leaves China on Sidelines", Stratfor.Com, 17 May 2002.

56 See also again Michael Roston, "Nuclear Archipelagoes? Secure Nuclear Materials in Southeast Asia", and Brad Glosserman, "Solving Asia's Nuclear-Waste Dilemma".

Table 8 - *Comparison of Various Proposals for an ASIATOM-Concept*

	Area of Cooperation								
Proposals	Safety	Public Relations	Industry Cooperation	Spent Fuel Management	Waste Management	Regional Safeguards	Pu-Management	Non-proliferation Export Control	Nuclear Disarmament
ASIATOM (Kaneko)	X	X	X	X	X	X		X	X
PACIFIATOM (Kano)	X	X	X	X	X			X	
Ryukichi Imai (Japan)	X		X(enrich)	X	X	(X)			
Atsuyuki Suzuki (Japan)				X	X(R&D)			(X)	
Kunio Uematsu (Japan)	X			X				X	
PACATOM (Manning)	X			X	X	X	X	X	X
William Dirks (USA)	X			X	X	(X)	(X)	X	
Jor-San Choi (USA)	X			X	X	X	X	X	
Y.M. Choi (S. Korea)	X		X(R&D)	X	X		X	X	
J. Charlson (Australia)	X			X	X	X	X	X	

Source: Park, Hahnkyu "Comprehensive Security and Regional Nuclear Cooperation in East Asia: the Case of South Korea" Prepared for a Workshop on "Asian Concepts of Comprehensive Security and Their Implications for Europe" Zushi, Japan, January 23-25, 1998.

Along with concerns about the rising numbers of new nuclear power plants and the uncertain strategic environment with historical rivalries among China, India, Japan, and South Korea as well as the hotspots of the Taiwan Strait and the Korean peninsula, there are also increasing worries over the fact that many of the regional nuclear power programmes have questionable oversight and control — often linked with poor transparency making it difficult to analyse, confirm and improve their safety record. The amount of radioactive waste will accumulate over the next two decades even if no additional nuclear capacity will be installed in North- and Southeast Asia. This waste will contain 450 tons of plutonium until 2010. The search for long-term storage facilities has already become a pressing issue for regional governments such as Taiwan that wanted to export to and store its nuclear waste either in North-Korea or Russia. Against this background, the proposal of an

ASIATOM organisation (following the *EURATOM* model in Europe – see *table 8*) is under discussion for several years.[57]

Conclusions and Perspectives — September 11 and the Security Implications

The expansion of the global civilian nuclear power programmes — particularly in Asia, Russia and other NIS — can increase the worldwide dangers of control and safe storage of fissile material. But the present civilian nuclear power stations need to be modernized to combat effectively the risk of nuclear terrorism and to ensure the security and safety of nuclear facilities as well as material anyway as the IAEA has recommended at the end of 2001.[58] The terrorist attacks in New York and Washington have highlighted new urgent priorities in international security and for Russia too. Although Russia employs physical, procedural, and technical measures to secure its weapons against an external threat, those measures date often from the Soviet era and are not designed to counter the pre-eminent threat faced today — an insider who attempts unauthorized actions.[59] But Russia is no longer the only security challenge in this respect. The IAEA has found more than 100 countries having no minimum infrastructure in place to properly control radiation sources. Through its programmes to help countries improve their national facilities for radiation safety and security, many IAEA countries in Africa, Asia, Latin America and Europe are making progress to strengthen their capabilities to control and regulate radioactive sources. But more than 50 countries that are not IAEA member states do no benefit from IAEA assistance and experiences and likely to have no comparable or regulatory infrastructure at all.[60]

Although a recent panel of 19 US nuclear experts (mostly from the nuclear power industry) concluded that US reactors faced no meltdown risk from a terrorist scenario in which hijackers might crash an airliner into a reactor[61], the situation might be at least different in other countries and regions such as Russia. Its air defence, for instance, is in a critical condition and cannot effectively safeguard strategic sites against suicide hijacker attacks. Even the Chief of Russia's Air Force, Anatoly Kornukov, admitted in an interview that a plane taking off somewhere in the Moscow region could hit the Kremlin before it could be intercepted by air defence

57 See F. Umbach, "Konflikt oder Kooperation in Asien-Pazifik? Chinas Einbindung in regionale Sicherheitsstrukturen und die Auswirkungen auf Europa" ("Cooperation or Conflict in Asia-Pacific. China's Tying into Regional Security Structures and the Implications for Europe"), (Muenchen: Oldenbourg-Verlag, 2002), here pp. 295 ff. (chapter 6.5). See in particular also the web-site — http://www.cscap.nuctrans.org/index.htm.

58 See Matthew Jones, *Financial Times*, 1-2 December 2001, p. 4.

59 See "Annual Report to Congress on the Safety and Security of Russian Nuclear Facilities and Military Forces", *National Intelligence Council*, Washington D.C., February 2002 (http://www.cia.gov/nic/pubs/other_products/icarussiansecurity.htm).

60 See "Controlling Radioactive Sources", *IAEA-Bulletin* 44/1/2002, p. 2 f. (3).

61 But the report has been heavily criticized by other US experts – see "Threat Assessment: Nuclear Plants Are at Risk, Experts Say", Global Security Newswire, 23 September 2002.

systems because the level of combat readiness requires 10-12 minutes to bring it up.[62] From 1994-1998, the Russian air defence force dramatically declined: the number of fighter aviation units was reduced by 2.8 times, that of air defence missile units by 2.1 times; in 2000, the air defence troops received only 65 percent of required funding; purchases of new weaponry have stopped; obsolete weaponry systems account for 65-80 percent of the air defence troops' armoury, and only 80 percent of the armament is combat ready, while Air Force units have received only between 6-8 percent of the needed fuel. Hence, in 1999 and 2000 an average fighter pilot spent just 11-12 hours annually in the air. Meanwhile, nearly half of the most important state objects have been deprived of direct air defence missile protection. A few days after the terrorist attack on the United States, a Russian analysis warned:

> "... even if unprecedented measures are taken to restore the resources of air defence, these efforts will not result in effective protection against air terrorism. Russia is too vast a country, and the number of strategically important or hazardous facilities on its territory runs to many hundreds. It is impossible to supply each such site with an air defence missile brigade or a fighter regiment equipped with state-of-the-art weaponry and placed on high alert status".[63]

European countries, too, face similar security challenges. France, for instance, installed an anti-aircraft missile to protect the nuclear processing plant at La Hague from possible attacks by terrorists and kept 10 fighter aircraft on 24-hour standby.[64] However, given the density of Europe's population centres and the industries, the armed forces would have very limited reaction time if terrorists are using small aircraft flying under the radar.

According to the same US expert panel of nuclear experts, terrorists could do little to create a public health hazard by damaging spent fuel shipments because it is cooled for several years before shipping to allow its temperature and radioactivity levels to decrease. Spent nuclear fuel cannot explode and does not contain radioactive liquid materials that could be released. However, international experts are divided in regard to the risk to the public from attacks on nuclear power plants — partly to the reason that the targets vulnerable to the widest range of threats were not nuclear but facilities where chemicals were manufactured and stored due to much less improved security during the last decade.[65] But as a new analysis by David Albright, a physicist and the President of the Institute for Science and International Security in Washington D.C., has convincingly argued in regard to Al Qaeda's nuclear ambitions, Bin Laden's terrorist group had only limited technological capabilities in Afghanistan

62 See the interview of Kornukov by Sergei Sokut, *Nezavisimaya gazeta*, 13 September 2001, p. 1.
63 So the analysis by Mikhail Khodarenok, *Nezavisimoe voennoe obozrenie*, No. 34, 14 September 2001, p. 5. See also Nikolai Novichkov, "Russian Air Forces Facing Protracted Crisis", *Jane's Defence Weekly*, 23 January 2002, p. 4.
64 See Victor Mallet/Robert Graham, *Financial Times*, 20-21 October 2001, p. 3.
65 See also Matthew L. Wald, *IHT*, 25 October 2002, p. 3.

to produce WMD, but "if it had remained in Afghanistan, it would have likely acquired nuclear weapons eventually". He concluded by pointing out:

> "A critical lesson of the documents found in Afghanistan is that groups like Al Qaeda see great value in the use of nuclear weapons. Al Qaeda, its spin-offs, and like-minded terrorist groups can be expected to struggle to enhance their chances of acquiring and using nuclear explosives, regardless of the costs to themselves".[66]

Furthermore, those documents found and seized in Afghanistan suggest that Al Qaeda was seriously considering attacks on nuclear power stations in Europe and the United States.[67] As an envoy of Chechen leader Aslan Maskhadov has also warned recently that future Chechen attacks in Russia may also include nuclear facilities as the next targets.[68] Meanwhile, the United States and Russia have agreed to set up a joint task force to prevent radioactive materials from falling into the hands of terrorists to produce "dirty bombs" (that would not have the destructive power of a nuclear weapon, but would spread toxic radiation when exploded). Given the widespread worldwide availability of radioactive material that could be used in a dirty bomb , the *IAEA* has demanded a new "cradle-to-grave control of powerful radioactive sources to protect them against terrorism and theft."[69]

Furthermore, despite signs of a growing and genuine commitment PR China's to non-proliferation as the introduction of a national control regime governing its export of missiles and missile-related technologies demonstrated last August, a reversal or at least a hiatus in China's adherence to international norms and bilateral commitments cannot be excluded in the near- and mid-term future. At present, for instance, Beijing's is still unwilling to sign a groundbreaking international code of conduct aimed at preventing the proliferation of ballistic missiles (*ICOC*). Moreover, in the future, internal turmoil, persistent interagency differences, changes in U.S. foreign and security policies, or developments in China's relations with other nuclear powers could undermine Chinese increasing willingness to participate constructively in international non-proliferation and export control arrangements as well as in regard to Beijing's promises to enforce its non-proliferation commitments internally. Given these security challenges associated with the proliferation of destructive technologies to hostile states or terrorist groups, an intensified transatlantic dialogue on China and proliferation as well as with Beijing on these various topics should be a high priority in the future for both sides of the Atlantic.

66 David Albright, "Al Qaeda's Nuclear Program: Through the Window of Seized Documents", *NAPSNET-Special Report*, 19 November 2002.
67 See *ibid*. and *Der Tagesspiegel*, 9 September 2002, p. 5.
68 See *Global Security Newswire*, 30 October 2002.
69 So the director-general of the agency, Muhammad el-Baradei – quoted following Serge Schmemann, NYT, 26 June 2002 (Internet-edition).

PROLIFERATION AND NON-PROLIFERATION : WHAT'S CHANGED-WHAT HASN'T ?

Jon B. Wolfsthal[*]

Public attention and concern over the proliferation and use of weapons of mass destruction is at an all-time high. Growing since the end of the cold war, concern over proliferation has reached near hysterical proportions (at least in the United States) after September 11. Even though those attacks did not involve the use of WMD, the subsequent and still unsolved anthrax attacks in the United States and dire warnings from all manner of experts and officials about the inevitability of terrorists acquiring WMD have elevated proliferation to the top of America's collective security awareness. There is no doubt that the public at large have become more interested in, exposed to, and aware and frightened of the threat of WMD proliferation as the "war on terrorism" has unfolded internationally.

Left unexamined as part of this new awareness, however, is whether the actual threat of WMD proliferation to terrorists has increased along with public perceptions of the threat. Has the rise of global terrorism as a defining issue changed the proliferation landscape? That the public discussion has increased, there can be no question. A survey of news articles published in the years immediately proceeding and following September 11 show an 8 fold increase in the number of pieces containing the words 'nuclear" and "terror". The potential for nuclear terrorism tops the list of WMD-based concerns, even though the possible use of chemical and some biological agents are considered more likely. As such, this paper centers on the risks associated with nuclear proliferation. Many of the findings, however, hold for chemical and biological agents as well.

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In assessing what has and has not changed as a result of September 11 it is useful to consider three questions:

- Has the actual risk of nuclear proliferation increased since September 11?
- Have the tools needed to deal with proliferation changed since September 11?
- What more should we be doing in the field of non-proliferation as a response to September 11?

Has the risk changed?

Proliferation has always been a matter, in its simplest form, of supply and demand. Some states have the materials or know how needed to produce WMD, others are seeking to acquire these capabilities. It has been recognized for decades that any *state* willing to dedicate the time and resources (financial, technical, political, etc) could eventually succeed in building nuclear weapons. Of late, there has been increased recognition that even a basic nuclear capability, let alone chemical and biological agents, is within the reach of small, sub-national groups, assuming they are well organized, financed and motivated.

Thus, in assessing whether the risk of proliferation has changed since September 11, the amount of supply and demand has to be considered. Moreover, the supply and demand question has to be assessed for the two main categories of potential proliferators; state and non-state actors.

Demand

Despite, or perhaps because of their incredible destructive power, nuclear weapons has proliferated at an amazingly slow pace. President John F. Kennedy's prediction of wholesale nuclear proliferation throughout the 1960s and 1970s failed to materialize, in part because of the techniques the United States and other countries developed to reduce the demand for nuclear weapons. The costs and technical difficulty associated with producing nuclear weapons from scratch also helped to slow the proliferation of these weapons, but other factors were at work.

U.S. alliances and military commitments negotiated with European states and in East Asia clearly were responsible, at least in part, for reducing the demand of several key countries from going nuclear. Others were discouraged through other incentives or disincentives, such as the establishment of legal norms against acquisition of weapons, safeguards on nuclear transfers, expert controls, sanctions and plane old diplomatic arm twisting. In still other states, such as South Africa, Brazil and Argentina, political circumstances changed the underlying regimes that sought to acquire nuclear weapons.

Developing regional dynamics in Asia, however, threaten to accelerate proliferation treands. The nuclear tests in India and Pakistan have come and gone, both states stand as full-fledged, if legally unaccepted nuclear powers, and their relations with outside states including the United States have never been stronger or more closely integrated. The "norm" against proliferation has been seriously weakened, with serious implications for those states pursuing or considering pursuit of a nuclear weapons capability. If India, after having gone nuclear can remain an integral part of the global economic and political mainstream, then what reaction would the world have if Japan developed nuclear weapons? The end game in North Korea is now anything but certain, and it is conceivable given regional dynamics that the Pyongyang could successfully possess an active weapons program despite it previous non-proliferation commitments.

Terrorism adds a new and less well understood dimension to the demand side of the proliferation equation. There is now no doubt that terrorist groups are seeking nuclear capabilities. Reports from Russian officials of Al Qaeda infiltration of sensitive Russian areas in search of nuclear assets are hard to verify, but a nuclear black market does exist and statements from various terror groups are clear enough to show an interest in acquiring these most horrific of weapons. What is less clear is the scope of the problem and how to address the root causes of the non-state-based demand. With nations, time can be bought by strong export controls, technology denial and law enforcement to control illicit transfers. These steps, however, were originally developed to buy time for regional or multilateral efforts to work at reducing the insecurity or other factors to spur proliferation (recognizing that such steps may not always be effective). With terrorist groups, some of the technology control tools can be effective at the source of proliferation, but are less effective once items reach the black market. Interdiction and law enforcement, reliant on intelligence, then become the primary actors. Most worrying, however, is a lack of tools on hand to reduce the demand for such weapons among terror groups. Terrorists have always existed, and they can be controlled only by limiting their resources and freedom of action, until ways are found to limit their anger and desire for weapons.

The realities on the ground are also driving terrorist interest in nuclear weapons. By definition, terrorists seek to play on existing fears and nothing poses as attractive a "panic button" as the potential fear created by having a TV news broadcast begin with the words "nuclear" and "attack." The vulnerability opened up in western societies by the portrayal of nuclear attacks in popular culture, responsible and sensationalist news outlets and even some non-governmental organizations all create an incentive for terror groups to be the first to acquire even a basic nuclear capability (RDD or actual nuclear device). All of these perceived vulnerabilities and actual fears could increase the desire by terrorists to "go nuclear" in one form or another.

It is also important to consider the "outdo" factor. The sheer scope of destruction achieved on September 11 raises the bar for other terrorist groups. To be sure, most terror groups will continue to rely on small-scale attacks, using suicide bombers, car

bombs, etc. The operation staged on September 11 took years and is beyond the capabilities of the vast number of terror groups. But for Al Qaeda or other top flight terror organizations, outdoing September 11 will become one of the many goals they seek to pursue. While no civilized person wants to see a repeat of September 11, now that it has happened, people are just a little more desensitized to such an attack. The first of a kind is always remembered more starkly. Just consider how many people talk about Hiroshima compared with Nagasaki.

The ability of states and non-state actors to acquire nuclear capabilities, however, have one thing in common. Both must pursue their acquisitions within the borders of states in the physical world. Military action in Afghanistan showed that even in lawless failed states, tools of traditional military power can affect the ability of non-state actors to operate. While victory over Al Qaeda is far from accomplished (or certain), their displacement has greatly complicated their operations and limited their ability to conduct large scale activities, such as develop large physical infrastructures. This simple fact shows that some of the tools used in combating state proliferation – export controls, law enforcement, etc can delay the acquisition of nuclear weapons even by terror groups.

Overall, it would appear that the state based demand side has remained fairly constant, even after September 11. Before September 11, Iraq, North Korea and Iran were the sum of the states of nuclear proliferation concern and this holds true today. If there has been increased interest among states to acquire nuclear weapons, it has not yet branched out beyond the states of concern that were known and the focus of multilateral non-proliferation efforts before the US terror attacks. As for non-state demand, it is impossible to quantify, but it seems logical to assume that as the war on terror continues, interest among some of the most well financed and ambitious of these groups may well increase for some type of nuclear capability. What has changed for sure is the awareness of the non-state dimension of the threat, but this should not be mistaken for an actual increase in the interest of terrorist groups to acquire weapons capabilities.

Supply

The issue of supply is easier to define and categorize. There is a finite amount (although massive by any measure) of nuclear weapons and weapons-usable nuclear material in existence. These materials, almost exclusively highly enriched uranium and plutonium, exist within the national stocks of a limited set of countries. Additional amounts of materials exist in the form of spent fuel from power reactors or submarines that could also be used to produce nuclear weapons with some degree of processing.

Although the scope of the fissile material issue is easy to define, there are tremendous challenges to adequately controlling and protecting these materials. The poor state of the Russian nuclear complex is well known, even if overall action to address the situation is not yet adequate. Yet even outside of the former Soviet Union,

considerable nuclear vulnerabilities exist. Research reactors in developing countries often lack top echelon security procedures. Civilian nuclear handling facilities often have accounting losses, and security systems for these sites have not been fully upgraded in the post September 11 environment. While no evidence exists to suggest large-scale facilities in the developed world have yet been compromised, the new security environment required even greater attention be paid to overall security and accounting in the nuclear power-reliant countries in Europe, Japan and elsewhere.

So even if the amount of nuclear material in the world has not increased, the vulnerabilities that exist in the former Soviet Union and elsewhere continue to pose a clear and present danger in the potential supply of weapons usable materials. This is to say nothing of the availability of materials for use in a RDD or dirty bomb. Decades of large-scale nuclear production (for weapons and peaceful purposes) in countries ranging from the United States and Russia, to India and Indonesia have left hundreds of thousands of tons of radioactive wastes and byproducts, many of which would prove formidable fodder for RDDs. The newly launched search for orphaned nuclear sources is only a small part of the effort that will be required if a global attempt to keep radiological materials out of the hands of terrorists is to be successful.

The non-state dimension of the proliferation problem also requires that previously under appreciated targets for nuclear materials be re-examined in a new light. This is happening in the nuclear power arena, but should also be further strengthened in the other non-military applications of nuclear technology. Food irradiation, research reactors, medical applications for nuclear materials all present potentially attractive targets for terror groups. Previously, supply questions generally addressed only high-purity, direct weapons usable materials. This definition has to change in the post September 11 environment.

New Tools?

As discussed above briefly, the tools used to address proliferation include legal norms, treaty verification, export controls, diplomatic and military alliances, intelligence and interdiction, law enforcement, deterrence and military action. These tools have been developed over the long history of the nuclear age, and have not been fundamentally changed after September 11. What has changed is the emphasis that the Bush administration places of various tools, with a clear lack of faith and favor for the legal norms and treaty-based regime. The "war or terrorism" has made use of military, intelligence and interdiction more prominent and, especially in the case of the United States, a more internally justifiable set of resources. But the overall set of non-proliferation tools has not changed to any significant degree in the past 14 months.

The tools to be applied, however, are different given the two parts of the proliferation problem: state and non-state actors. Traditional tools of treaties, legal norms, technology denial, and export controls remain indispensable tools to prevent greater proliferation remain vital in the prevention of state proliferation. The lack of

emphasis on the non-proliferation regime on the part of the current U.S. administration, however, threatens to undermine state-based non-proliferation efforts at the same time that the non-state actor issue has come to the forefront. Combined with the perceived tendency of the Bush administration to rely on "military first" options, this weakening of the state-based non-proliferation regime is dangerous and creates the increased potential for proliferation by states in the long run. It is unfortunate timing that when the world has become more focused than at anytime in its history on the horizontal proliferation of nuclear weapons that the emphasis on addressing regional causes of proliferation (insecurity, military conflict or imbalances, etc) has diminished. This focus on reaction, and a lack of emphasis on prevention poses long-term security problems for the United States and its allies.

The increased focus on non-state actors and proliferation in the United States can be clearly seen in public statements and publications from the Bush administration. The much-covered National Security Strategy of the United States of America released in September 2002 maintains that "[t]he gravest danger our Nation faces lies at the crossroads of radicalism and technology" Public fear about the possibility of a nuclear attack (RDD or atomic) as well as the overall wartime mindset of the administration allows decision makers in the United States to rely increasingly on more dynamic, immediate and in many cases military options. This is not without merit, however, since key tools to prevent the acquisition or use of nuclear weapons by states may prove ineffective against non-state actors. Deterrence, in particular, is difficult to enforce when terror groups care little for the territories in which they operate, or when their goal is in infliction of damage, not political, military or geographic changes. While long-term options exist for reducing the root causes of terrorism (poverty relief, despite resolution, etc) these will take decades to implement and are not seen by primary national security actors as the front lines of their counter-terrorism strategy.

The tools used in countering proliferation also appear to have remained largely static in the wake of September 11, although the shift in emphasis away from legal norms present among Bush administration officials before September 11 have been reinforced by the attacks and the subsequent war or terrorism. However, for the United States the balance between the roughly divided categories of diplomatic and military options have clearly shifted toward more immediate and direct approaches. In many cases, military and less legalistic approaches may be required in extreme circumstances given the nature of the terror threat and the consequences associated with the use of nuclear weapons or even RDDs. Regardless, in the long run, the full suite of non-proliferation tools from regional security and alliance maintenance to hard-core force projection will be required to successfully combat the overall risk of proliferation by state and non-state actors. Additional work, however, clearly needs to be done to understand how traditional non-proliferation tools may need to be adapted to address non-state demand for, and acquisition of weapons of mass destruction.

What's missing?

It is unclear that demand for nuclear weapons and weapons materials and expertise has increased among state or non-state actors after September 11, but awareness of this issue is undeniably on the increase. This presents the non-proliferation and security communities with an opportunity to obtain greater support and attention for under appreciated non-proliferation efforts and a responsibility to develop new approaches to address those aspects of the threat that are new in the current environment. More creative thinking, as well as hard core investment in time, money and other resources are required to address the new aspects of the proliferation threat, and whether and how it may be possible to adapt traditional non-proliferation approaches to some of the new aspects of the proliferation problem. At the same time, it is critical that viable aspects of the traditional non-proliferation regime be fully utilized and reinforced.

The debate continues in the United States over the current value and payoff of the international non-proliferation regime. In many respects, people's views can be defined on proliferation issues by whether they see the current threat of proliferation as being under control or out of control. Many of those who see the threat of proliferation increasing questions the very basis on the international system of treaties, norms, legal instruments and controls that have arguable slowed and even stopped the acquisition of nuclear weapons by over a dozen countries. For those that see the risk of proliferation as less acute (but no less severe in its consequences), many continue to see the "regime" as an indispensable part of U.S. security efforts aimed at reducing the nuclear threat to the United States and its allies.

Regardless of their view, the traditional non-proliferation regime was designed to deal with the state-based problem. Although the basic issues of supply remains a state based problem, the demand by non-state actors is an emerging problem that will require a mixture of traditional an innovative approaches to address.

The largest aspect missing from the post-September 11 proliferation environment, however, lies not in the international realm of diplomacy or in the development of some innovative military capabilities. Terrorism, as its name implies, thrives on terror – something that remains close to the surface in the populations of the United States and elsewhere. This is true in the area of nuclear proliferation like in no other aspect of the terrorism threat. While steps are made domestically and internationally to seek out and prevent acts of terrorism from taking place, inadequate investments are being made domestically for preparedness and, to an even greater extent, in public education about the real risks and consequences of acts of nuclear terrorism. Just as the civil defense effort in the 1950s helped calm and educate (albeit wrongly in many cases) the American public, so to does the current environment require a broad-based, national campaign to help the averagen citizen understand the real risks and consequences of a nuclear attack and what steps can be taken to mitigate such an attack should it occur. Unfortunately, the government and the media, as well as major

components of the NGO community, have been swept up in the hyping of current threats, to the detriment of policy and the public perceptions of the threat.

The creation of the Homeland Security Department in the United States will reap some benefits in this battle, but the real impact of this new department are likely to be years if not decades away from becoming reality. It is true that the U.S. government has invested tens of millions of dollars in buying equipment and providing training for first responders, purchasing vaccines for possible BW attacks, and increased law enforcement and intelligence sharing with local jurisdictions. But almost nothing is being done in the areas of public education or grass-roots training for what to expect and how to respond to various types of nuclear attack scenarios.

At the top of the list for these efforts should be greater public education about the real risks associated with the possible use of RDDs. The use of such devices is by far more likely than the possible use of an atomic device, but the majority of Americans have no conception about the real consequences associated with the detonation of a dirty bomb. The reality that the blast radius of an RDD would be the main source of casualties, expect in the most extreme cases is virtually unknown to the average citizen, or to the mildly informed newscaster or politician.

Large payoffs could accrue from a concerted government sponsored training program for members of the mainstream media (print, radio and TV), local community leaders, and local and state-wide politicians. In many cases, half-day seminars would be sufficient to start the process of education in most communities, with additional work being required in the largest of US cities with massive populations. In addition, local jurisdictions should consider developing and adopting modules on nuclear issues and policy in high schools, with a particular emphasis on the facts surrounding nuclear radiation, terrorism, and non-proliferation. This effort should be completely separate from any efforts led by the nuclear power industry, which would be seen as a biased source of information for such efforts in the United States.

NON-PROLIFERATION: POSSIBLE NEW TRENDS AFTER SEPTEMBER 11

Alexander A. Pikayev[*]

Erosion of Multilateralism?

Terrorist attacks against the World Trade Center in New York and Pentagon near Washington, DC made on September 11, 2001 has consolidated and accelerated developments in global international security relations, which have been already visible in 1990s. The global trends have inevitably affected many global regimes, including non-proliferation ones. The developments could be catalogued into three major categories:

- Dramatic shift of global balance of power in favor of the United States as a result of its victory in the Cold War and economic boost during 1990s.

- Increasing focus on non-state actors and sense of urgency in preventing diversion of weapons of mass destruction (WMD) after the terrorist attacks against the United States took place on September 11, 2001.

- Shifting global security priorities to Asia – the main source of international terrorism, wars and proliferation of the WMD.

Changing positions of major global players, a need to address new security agenda together with an urgent task to deal with proliferation challenges affect multilateral non-proliferation regimes and mechanisms of their implementation. All these is producing an incentive to circumvent them by acting plurilaterally or even unilaterally, and even gradually replace the existing regimes by a network of bilateral

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informal asymmetric arrangements enforced by coercive economic, political and military measures.

Changing Global Balance of Power

The major change was represented by a dramatic shift in world balance of power occurred in 1990s. With the disintegration of the Soviet Union in 1991, the Cold War's bilateral system of international relations has been collapsed. However, it did not led to establishing truly multilateral international security system. While the United States enjoyed unprecedented economic growth since the end of the Cold War, the second and third largest Western nations - Japan and Germany - faced stagnation. The decade-long recess in Russia, which by 1998 lost almost half of its GDP it possessed during the Soviet times, transformed it into medium power with little chances to regain higher international status in the foreseeable future. Leading developing nations - China, India, Brazil – have demonstrated significant progress, but so far failed to challenge the US global loneliness.

The international security system, emerged by early 2000s, could be considered as *a unipolar plus*, where the United States represents the only global pole of power, while all the others put together have regional influence and limited global interests, which not necessarily oppose those of Washington. The United States – surrounded by a cluster of much lesser sized "big ones", possessing different relations either with Washington or with themselves. Neither great power might efficiently challenge the US global interests, nor, due to their own disagreements, they could unite their policies with an aim to balance the American might.

Majority of the present day international non-proliferation regimes have emerged during the Cold War and are based on bilateral or multilateral agreements. As a result, they not necessarily correspond anymore with underlying world balance of power. Even the Nuclear Non-Proliferation Treaty (NPT) is pressed by the fact, that emerging developing nations either remain outside of the Treaty, or are becoming less patient with what they perceive its discriminatory nature when only five permanent members of the UN Security Council have a legal right to possess nuclear weapons. Indeed, since the United Nations was established in 1940s, three from five permanent members have lost a major part of their international influence, while new influential international players have emerged beyond the P-5.

The pressure from the bottom – from emerging Third World nations – is complicated by rising gravity coming from the top. The United States, given its overwhelming economic, political and military supremacy, is becoming increasingly dissatisfied with a need of looking for consensus among dozens of countries – as it is required by multilateral mechanisms. Very often, such consensus is very difficult to achieve, it requires long and painful negotiations, and the nature of the achieved multilateral deal could be far away from the original US expectations. In other words, Washington perceives multilateral regimes as very slow and often incapable to provide with resolute and efficient response when needed. Moreover, in many cases potential

military or political contribution of majority of other countries for the problem solving would be dwarf comparable to that of the United States. Other countries also have a limited capability to create obstacles for US unilateral action if Washington decides so. The United States might reasonably ask: why to waste time and commit itself to painful multilateral negotiations process with unclear, most likely inconclusive results, when expected benefits from collective action might be doubtful, but potential price for ignoring the mechanism at all would be acceptable?

Furthermore, the majority of international non-proliferation regimes are based on a declaratory assumption that all their participants have to bear equal constraints, for instance, refraining from conducting nuclear tests. Such provisions are also increasingly challenged in Washington. Since the United States would have to act alone, and potential contribution of the others might be marginal at best, or not needed at all, why the United States should accept international legal limits on its military capabilities and modernization, which makes it more difficult for Washington to address its security concerns? Value of international regimes in preventing undesirable military developments in other countries has been also reduced. Partially it could be explained by a substantial gap between the United States and others' capabilities. The other reason is that the regimes are growingly considered as miserably inefficient in preventing suspicious states from covertly acquiring nuclear, chemical or biological weapons. This provides additional disincentive to accept international legal limits on the US freedom of military or political action in exchange for preventing nuclearization of countries of concern.

The September 11 attacks gave a sense of urgency of acting resolutely and rapidly in order to prevent another terrorist attack on American homeland, possibly with use of weapons of mass destruction. Shifts in domestic public opinion in the United States in favor for military operations overseas permitted Washington to occupy more proactive position in dealing with its non-proliferation concerns. As a result, even more impatient US attitude towards regimes and their implementation mechanisms might be expected.

Shifts In Perceiving Sources of Threat

The September 11 attacks have dramatically confirmed what was becoming more evident in 1990s. Security risks based on threats of traditional military aggression were giving their way to non-traditional threats, including terrorism. While in the 20th century the primary non-proliferation focus has been made on preventing the states from acquiring WMD capabilities, in the post September 11 environment a need of dealing with non-state actors has become much higher priority. This does not mean, however, that the focus on the states of concern has been moved away. To the contrary, preventing them from obtaining WMD capabilities has also become more urgent task. First, it happened because of a risk that once acquiring the WMD, some of the states might provide the weapons for the terrorist groups they would probably support. Secondly, the increasing perception of threat coming from terrorists armed

with the WMD has increased importance of preventing proliferation in general in the eyes of both decision-makers and public opinion.

Existing non-proliferation regimes, perhaps, with the exception of the CWC[1], do not provide adequate tools in dealing with the non-state actors. Together with above mentioned urgency in confronting international terrorism, this produces additional pressure towards relative marginalization of existing regimes and solving perceived proliferation challenges through higher reliance on counterproliferation measures.

Increasing focus on non-state actors has led to changes in the list of non-proliferation priorities. While traditionally the major accent has been made on nuclear weapons and weapon usable fissile materials needed for producing nuclear warheads, recently much more attention is paid to assets, which could be used by non-state actors for producing the WMD without having access to large-scale developed industrial infrastructure. For making nuclear weapons one should have not only necessary expertise and materials, but also developed industrial capabilities necessary for producing nuclear weapons components and assembling the warheads. It proved difficult even for many states – which, by definition, possess much larger recourses and ability for covert operations than non-state groups. To the contrary, producing chemical and, especially, biological weapons requires relatively easily attainable expertise and laboratory equipment. The CBW attacks of Aum Shinrikyo in Tokyo underground in 1990s, as well as anthrax mails in the United States in 2001, have demonstrated that chemical and biological agents could be genuinely made by terrorist groups and even determined individual. Therefore, the CBW has become the more urgent danger than in the past.

Another technology potentially attractive to non-state actors is radioactive substances. If one has basic knowledge and access to radioactive sources – which are widely dispersed and could be found in millions ill protected civilian facilities all over the world - it could gather certain amount of the material and disperse it in densely populated area by using conventional explosives. Although such attack would not lead to large numbers of immediate deaths, it might cause a substantial disruption of important economic activities and could require considerable decontamination efforts.

Countering the risks of chem-bio and radiological terrorism requires primarily national intelligence and police activities for preventing the terrorist attacks, as well as medical, sanitary and other emergency response measures in order to fight with consequences of their use. International cooperation would be limited by exchange of information, technology, disrupting financial flows to the terrorists and destroying their international infrastructure. This would necessitate substantial expansion of

1 The Chemical Weapons Convention prohibits the chemical weapons at all. Therefore, its universalization together with proper verification might eventually eliminate state's CW stockpiles as sources for their potential diversion for the terrorist purposes.

cooperation between law enforcement agencies of individual countries, which could possibly develop into building up of new multilateral regimes.

Another dimension of international cooperation – increasing safety of sites where WMD assets are located in order to prevent their diversion into hands of countries of concern and non-state actors. In 1990s, the precedent for such cooperation was established by the US, EU and Japanese cooperative threat reduction programs with Russia. Higher priority for chemical, biological and non nuclear weapon usable radioactive materials require expansion of those programs both horizontally and vertically. They would have to address safety issues in Russia's chemical and biodefense complexes, as well as in other major sources of radioactive materials like possibly nuclear power plants and sites of nuclear submarines dismantlement. Besides that, other countries, like India and Pakistan, should be also considered for being involved into such programs.

Geostrategic Developments

The end of the Cold War brought some sort of "end of history" into European security relations. Dramatic Russia's retreat from the Central Europe together with its transformation and economic and military decline provided the continent with historically unprecedented level of security. European integration has also made wars impossible between traditional enemies in the west of the continent. The EU enlargement to the East is bringing stability for the Central Europe, as well. Although local conflicts in southeastern and eastern periphery of Europe still remain possible, they would not be able to escalate into a large-scale warfare similar to what the continent faced during the World War I and the World War II. The attacks of September 11 and their origin in the Islamic Sunni fundamentalism made that reality crystal clear. They have also shown that the center of gravity of international security has moved to Asia, which has become central for future global developments.

The increasing importance of Asia is bringing significant corrections into global non-proliferation picture. All three non-NPT nuclear powers, together with three of the Bush Administration's "Axis of Evil" states are situated in that continent. Perhaps, beyond South-East Asia, a risk of nuclearization of other major regional powers is quite conceivable, too. So far, the Asian states have failed to elaborate European-type pattern of international relations, and links between them are often poised by hostilities. It is Asia, where a nuclear war is quite possible already in the foreseeable future. Besides the EU and Brazil, all other "big ones" are located in Asia and possess vital security interests in many of Asian regions, which are growingly intertwined.

While Asia is becoming a primary stage for international security, the role of non-system players is increasing. Within the Asia-centered views, India, Pakistan, Israel together with potential challengers from inside the NPT, matter much more than in the past Europe-centered security system. Like in a case of India and Pakistan, logic of regional competition might trigger WMD aspirations even in nations so far demonstrating restraint and satisfied by the US security umbrellas.

Furthermore, Washington's proactive policy in the continent, which, indeed, represents the major source of threat for the United States, could create additional incentives for asymmetric resistance. The situation of tremendous discrepancy between Asian both state and non-state players, from the one hand, and the United States, from the other, will be maintained in the foreseeable future. If a US action in Asia would confront vital interests of local power or non-state groups, they would seek asymmetric response. For the state actors, that could be made through gaining WMD, especially nuclear and intercontinental ballistic missile capability, in order to prevent the United States from acting militarily against them. For the non-state groups, the asymmetric response might be achieved by a threat of a terrorist action, potentially involving weapons of mass destruction. Therefore, along with higher role of Asia in the global security, priority of combating proliferation risk among the continent's countries should also increase.

In the Past, dealing with Asian powers through multilateral regimes proved to be difficult. India, Pakistan and Israel have refused from joining the NPT as non-nuclear weapons states, while Iran, Iraq and North Korea are suspecting of pursuing covert nuclear weapon program, formally remaining the NPT member-states. Equally, informal supply-side export control regimes were also unsuccessful in addressing Asian proliferation risks. For instance, the MTCR failed to prevent acquiring missile capabilities by a number of local powers at which it was focused - India, Pakistan, Iran and North Korea. The MTCR-related arrangements were not able to prevent significant missile deliveries from China to Pakistan, which were critical in successful development of Pakistani missile program. As a result, the Asian countries became a primary source of secondary missile proliferation.

In the non-proliferation area, pledges of Asian countries for pursuing self-restraint policy have been often achieved through talks with the United States and other powers. India and Pakistan made some attempts to regulate their nuclear competition on a bilateral basis, and made unilateral pledges not to export missile and nuclear technologies. North Korea promised to return back to IAEA safeguards under the 1994 Framework Agreement with the United States. More recently, Pyongyang made a pledge to adhere self-imposed unilateral missile test ban also on bilateral base, during summit meetings with leaders of Russia and Japan. Israel and China accepted MTCR guidelines for their export control policy in non-legally binding MOUs signed with the United States. In 1990s, Russia and China refrained from certain nuclear and missile deliveries to Iran as a part of their specific bilateral deals with Washington as well.

Given the past experience, it seems problematic that in times when vital security interests of Asian "big ones" are growingly at stake, they could be convinced to solve their proliferation disputes through multilateral agreements. Moreover, the only credible scenario of involving non-NPT nuclear powers into non-proliferation regimes through signing by them the Comprehensive Test Ban Treaty (CTBT) and the

Fissile Material Cut-Off Convention, appears inconceivable due to the US refuse to ratify the CTBT, and a deep deadlock in the Cut-Off negotiations in Geneva. The Asian states might be even more reluctant to adhere any multilateral regimes if they suspect that their alleged non-compliance would be used as a pretext for possible US-led military intervention. For the United States, it might be also easier to gain certain non-proliferation fruits through bilateral dialogue, which Washington could conduct from a position of strength, or by using political, economic or military coercion.

From Multilateralism To Ad Hoc Arrangements?

Due to imbalanced structure of post-Cold War international relations, multilateral non-proliferation regimes face growing challenges from emerging powers in the Third World, as well as from the only truly global superpower – the United States, which tends to perceive many of those regimes as too slow, inefficient and even useless and counterproductive in addressing important Washington's security concerns. The pressure is further strengthened by a pressing need to address proliferation risks in order to prevent diversion of the WMD into hands of non-state actors or of states, which might support them. This requires building up new international regimes, different from existing non-proliferation ones. Growing importance of Asia – the continent, where non-proliferation regimes face major challenges – might increase role of ad hoc arrangements, which have already occupied a prominent role in regulating non-proliferation policies of many Asian powers.

Certainly, ad hoc arrangements have generic disadvantages, like reversibility, lack of verifiability and predictability. Due to that, it would be undesirable to dismantle already existing regimes, especially legally binding ones, as obsolete and impotent. Instead, the focus should be made on strengthening them, including elaborating measures enforcing compliance with the regimes. At the same time, ad hoc arrangements might be also useful in areas, which remain uncovered by existing regimes, or where the regimes have proved their inefficiency. In this, coordination of policies of powers interested in maintaining non-proliferation values and their collective – or plurilateral – actions aimed at addressing the most pressing problems, could increase sustainability of informal pledges and arrangements.

US-Russian Disagreements Over Iran

Before September 11

The US-Russian relations regarding Iran demonstrate importance of *ad hoc* commitments beyond existing non-proliferation regimes. In early 1990s Russian Ministry of Atomic Energy (Minatom) agreed to complete light water nuclear power plant located at Bushehr (southern Iran). Initially, the construction was started with assistance from Siemens in 1970s, but was halted after victory of a radical Islamic revolution in Iran in 1979. In the beginning, the Iranians asked the Russians to build up one reactor, but later they hinted that contracts on few more reactors might follow on.

From mid 1990s the United States consistently opposed Russia's intentions to assist the Iranians in "peaceful" nuclear industrial developments. However, Moscow rebuffed the US pressure arguing, that such a peaceful cooperation is not only its right, but also an obligation under the Article IV of the NPT, which asks the nuclear powers for assisting non-nuclear states in developing their peaceful nuclear energy capabilities. It also claimed, that Minatom plans to deliver a reactor to Iran of the similar type the US-led Korea Energy Development Organization (KEDO) was going to deliver to North Korea with an aim to discourage it from developing nuclear weapons. Referring on the KEDO precedent, some Russian experts accused Clinton administration in double standards, asking for why a light water reactor to be given to the North Koreans was good to the non-proliferation, while delivering the similar light water reactor to Iran was against non-proliferation values.

In 1995, the Clinton administration convinced the Kremlin to cancel some of the most sensitive components of the Russo-Iranian "peaceful" nuclear cooperation. Reportedly, Minatom was ordered not to sell centrifuges, which could be used for Uranium enrichment. Since that, the US-Russian dialogue did not bring any practical fruits on the issue of the Bushehr construction, although there were few marginal results in the area of Russian conventional arms sales and transfers of missile technologies to Iran.

The problem of the Clinton administration was that it lacked carrots sufficient enough to convince the Russians to halt the Bushehr project. According to the Minatom estimates, construction of one reactor *per se* could bring the agency up to $ 800 million. Upon the plant's completion, it would be able to receive significant additional income from nuclear fuel deliveries and reactor maintenance. The expectations were further increasing due to Iranian hints on possibility of building up additional reactors. Privately, the Minatom officials express hopes that they could sign contracts on building up to eleven or even twelve reactors in Iran eventually.

At the same time, the United States lacked opportunities to offer the Minatom an alternative deal of a size adequate enough to compensate it for a potential loss of the Bushehr contract. Although Minatom possesses significant economic relations with the United States, majority of existing US-Russian contracts in nuclear area are linked to destruction of Russia's nuclear stockpiles and their safe storage. Those activities are in the US interests, and therefore, it proved to be impossible to link them with the Russo-Iranian cooperation.

Iran is a country of a significant political interest for Russia. Tehran was instrumental in convincing Islamic countries not to overreact on Russian operation in Chechnya; the Iranians also helped Moscow to broker a power sharing agreement in Tajikistan – the only Farsi-speaking post-Soviet state in the Central Asia. As a result of the agreement, a civil war there has been de-escalated to a low intensity level. Both Moscow and Tehran opposed the Taliban on Afghanistan and supported the Northern Alliance; they both are concerned with Turkey's penetration into the

Southern Caucasus. Finally, Iran provides the only reliable ground access to Armenia – the only Russia's ally in the region. The Armenians face a blockade from Turkey and Azerbaijan, while access through Georgia remains non-reliable given routine instability in that country.

Indeed, Moscow has disagreements with Iran on its policy towards Israel. The Kremlin experienced difficulties in accommodating to anti-Israeli attitude expressed by Iranian conservative ayatollahs. Russia considers Israel as a unique Russian-speaking entity situated beyond the former Soviet borders, where hundreds of thousands of Russian citizens are living. Furthermore, Moscow found impossible to convince Tehran to accept its plan of splitting up Caspian oil-rich shelf among coastal nations, and the Iranians continue to dispute the settlement Russia has recently reached with its immediate neighbours – Kazakhstan and Azerbaijan.

Despite the differences, Iran still remains the only major player located to the south from vulnerable Russian borders, whose political interests have considerable positive overlap with the Russia's. Under those circumstances, Moscow might pay a prohibitive political price, should it suddenly abrupt the Bushehr deal.

After September 11

However, since the Bush administration came into power, new chances for solving the US-Russian disagreements over Iran have emerged. In 2001 Minatom successfully promoted legislation through the Russian Federal Assembly (the Parliament), permitting it to import spent fuel from foreign nuclear power plants for its disposal inside Russia. The Minatom expects to gain up to several billion dollars a year from potential contracts of that kind. Vast majority of the spent fuel available in international markets is of the US origin. The US law prohibits its export to Russia, because Moscow and Washington still failed to conclude an agreement on peaceful nuclear cooperation. Thus, the United States has suddenly received leverage over the Minatom, which it could try to use in the Iranian context.

Reportedly, already in late 2001 the Bush administration offered Moscow to lift a ban on exporting spent fuel of the US origin to Russia. In exchange it wanted that the Kremlin halted the whole Bushehr project and imposed moratorium on all conventional arms sales to Iran[2]. The Russians did not accept the proposal, partially because of significant potential political and economic cost of abandoning the whole Bushehr project. The other reason was represented by the conventional arms sales component of the US initiative. In Russia, the arms sales are primarily controlled by *Rosoboronexport* state owned company. Lifting ban on spent fuel export would benefit Minatom, but not the *Rosoboronexport* and other arms exporters. Therefore, they did not possess any interest in the US proposal, as well.

2 In late 2000, in a letter addressed to the United States, the Russian Ministry of Foreign Affairs denounced the 1995 Russia's unilateral pledge not to sign new deals on exporting conventional arms to Iran.

By summer 2002, a more practical approach was debated in Washington. According to some data, a part of the administration favored more narrow approach. The spent fuel ban could be lifted in exchange for halting the most sensitive elements of Russo-Iranian cooperation (including capabilities enabling to develop independent close fuel cycle, deliveries of research heavy water reactors, Uranium enrichment equipment, etc.), while the light water reactors' deliveries to Bushehr – the most expensive component of the contract – could go on. However, at that time the idea did not meet unanimous support in the administration, which prevented it from becoming an official US position.

Soon after that, the Minatom announced its plans to construct three-to-five additional reactors in Iran. It was an unpleasant surprise for the United States, since before that a possibility of building up only one or two additional reactors was discussed. This has further delayed opportunities to break a deadlock in the US-Russian dialogue over Iran. During the Fall 2002 the dialogue between Moscow and Washington continued, but without any known progress.

At the same time, concerns of the Putin administration on international terrorism, particularly involving weapons of mass destruction, led to certain shifts in Russia's export control policy. In 1990s, some Russian quarters did not pay sufficient attention to the non-proliferation, and even believed, that - to an extent - the proliferation might help to develop multipolar world – a declared priority of Moscow's foreign policy in late 1990s. After 1999, however, the Kremlin started to realize that proliferation of nuclear weapons in Islamic world could make it easier for Islamic terrorists to gain it and use it against Russian targets.

However, the shift still has a limited impact on Russia's policy towards Iran. The Kremlin perceives that it faces a threat of Islamic Sunni fundamentalism financed primarily from sources in Saudi Arabia and Turkey. Shiite Iran does not fully fit into that threat perception and sometimes is even considered as a quasi ally in combating the radical Sunni movements.

Nevertheless, in 2002 the Minatom informed the Iranians - quite suddenly for them - that it wanted Iran to return spent nuclear fuel from Bushehr back to Russia. It was an apparent attempt to deprive Tehran with an opportunity to use the spent fuel as a source for producing weapon grade nuclear materials. Moscow has bluntly said, that no contract on delivering spent fuel would be signed with Iran unless it agreed on return of the spent fuel. As far as it is known, in the past the Minatom consistently avoided from establishing such straightforward linkage between fresh fuel deliveries and spent fuel return due to fears that the linkage could undermine the whole project. Therefore, the 2002 linkage clearly reflects some shift in Russia's policy.

After hesitating for several months, in mid-Fall Tehran had to accept the Minatom condition of the spent fuel return.

It is difficult to say, what was the main reason of changing Russia's position on the spent fuel. It might be a result of the US pressure: the Kremlin wanted to demonstrate that it was sensible for the American concerns. It could be also a consequence of Moscow's own new proliferation fears accompanied by a disappointment on the Iranian attitude towards Israel and the Caspian shelf. Or, a combination of two factors took place.

So far, short-term solution of the US-Russian disagreements over Bushehr could be found through a deal of a kind, which was discussed during last summer. The most sensitive elements of the Russo-Iranian cooperation should be halted, while the reactors deliveries could proceed forward. From its side, the United States could lift a ban on spent fuel export to Russia. However, there are many questions here still to be solved. How the dispute about a number of reactors to be sold to Iran could be settled? Whether conventional arms sales could be a part of the deal, or would they require additional bargain? And – does the United States need such a deal at all in times when Washington prefers military solution? Would Bushehr become the second Osirak?

NUCLEAR DETERRENCE ISSUES IN THE POST-SEPTEMBER 11 WORLD: AN AMERICAN PERSPECTIVE

Michael O. Wheeler[*]

American Deterrence Thinking Prior to September 11

During the Cold War, the principal threat to America's vital interests was posed by the Soviet Union with its vast armed forces and a massive nuclear arsenal. The competition was global but with a special focus on the plains of Central Europe where the militaries of NATO and the Warsaw Pact faced off against one another. The U.S. and its allies soberly accepted the possibility that a major armed confrontation could escalate to an apocalyptic nuclear war. Indeed, they worked hard to convince the Soviets that this was a serious prospect. NATO politics demanded a strategy of nuclear deterrence since any major non-nuclear war under almost any assumptions would devastate Europe.

The Cold War also was denominated in political terms, however, and after the death of Stalin in 1953, the two armed camps gradually accepted that they could co-exist with one another. Soviet leadership proved over time to be essentially conservative, and in the non-military dimensions of the competition, the West had the upper hand. This made possible an American grand strategy of deterrence and containment. Nuclear weapons were at the heart of this strategy and nuclear deterrence was its central theme.

A succession of American security reviews adjusted nuclear deterrence to changing circumstances, e.g., NSC 68, NSC 162/2, NSDM 242, PD 59, and NSDD 13. NATO policy also was adjusted in alliance strategy documents strongly influenced by

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Washington such as MC 14/2 and MC 14/3 and in the strategic concept of the alliance.[1] Strategic stability came to be understood largely in nuclear terms, with sub-themes of crisis stability, second-strike stability, and arms race stability. The ABM Treaty and a succession of bilateral strategic arms treaties (the SALT and START treaties) completed the intellectual framework.

The above description is, of course, an enormous over-simplification of global politics from the late 1940s to the late 1980s, if not of the 20th century itself. Philip Bobbit, for instance, makes a compelling argument that the Cold War was the culminating phase of an epochal struggle (he calls it the Long War) that began in 1914—an episode that marked a turning point in history comparable, for instance, to the Peloponnesian Wars, the Punic Wars, the Hundred Years' War, the Thirty Years' War, or the Wars of the French Revolution.[2]

What did nuclear deterrence accomplish during the Cold War? James Schlesinger has suggested that nuclear weapons gave the United States the confidence needed in the late 1940s to manage a sea change in traditional American foreign policy and remain deeply and actively involved militarily in world affairs.[3] Michael Howard has argued that nuclear weapons provided the reassurance the Europeans needed in the face of the clear and present Soviet threat to undertake physical and social reconstruction in the critical first decade after World War II.[4] Ernest May reminds us that Elspeth Rostow once remarked that "the atomic bomb should have received the Nobel Peace Prize," that is to say, "that dread of nuclear war, not of war *per se,* transformed the calculus that had governed inter-state or international relations ever since states and nations came into being".[5] One can agree with all these assessments, as I do, and still argue, as Lawrence Freedman does, that "Nuclear deterrence worked better in practice than in theory. It was barely tolerable as a grand strategy, overhung as it was by the nagging question: 'what happens if deterrence fails?' "[6]

What if nuclear deterrence fails between great powers? When the Cold War ended, officials and publics worldwide breathed a collective sigh of relief that it had not, close calls notwithstanding. Nuclear apocalypse had been avoided and the world survived. Over the decade of the 1990s, an increasingly prosperous and powerful United States searched for a grand strategy to replace containment of Soviet

1 For a discussion relating shifts in American strategy to shifts in NATO strategy, see Michael O. Wheeler, "NATO Nuclear Strategy, 1949-1990" in Gustav Schmidt, ed, *A History of NATO*, Vol 3 (Palgrave, 2001), pp. 121-39.
2 Philip Bobbitt, *The Shield of Achilles* (Alfred A. Knopf, 2002).
3 James Schlesinger, "The Impact of Nuclear Weapons on History", *The Washington Quarterly* (Autumn 1993), pp. 2-8.
4 Michael Howard, "Reassurance and Deterrence: Western Defense in the 1980s", *Foreign Affairs* (Winter 1992/1993), pp. 309-23.
5 Ernest R. May, introduction to John Lewis Gaddis *et. al*., eds, *Cold War Statesmen Confront the Bomb: Nuclear Diplomacy Since 1945* (Oxford University Press, 1999), p. 3.
6 Lawrence Freedman, *The Revolution in Strategic Affairs,* Adelphi Paper 318 (Oxford Press for the International Institute for Strategic Studies, April 1998), p. 20.

expansion and to adjust deterrence (increasingly understood in non-nuclear was well as nuclear terms) to the post-Cold War world. The enemy now was seen to be chaos across the globe: regions swept with ethnic violence that had been suppressed during the Cold War; failed states descending into brutal, genocidal civil wars; a Russia not yet democratic and stable; Communist China, growing stronger, with uncertain ambitions; regional powers like Iraq whose governments and patterns of behavior led Washington to view them as rogues; the proliferation of weapons of mass destruction (WMD) and missiles; and a host of increasingly dangerous transnational challenges, including newly empowered forms of terrorism.

This threat seen in the round, while still highly lethal and increasingly complex, did not appear to threaten state survival. Publics in both the United States and Europe had a new sense of security. In searching for a grand strategy to replace containment of Soviet expansion, the American government sometimes seemed like a bright, enthusiastic, well-funded student at a world-class university, someone who wanted to study everything, do everything, become everything. If you take a course urged on you by others against your better judgment and find it to be too hard, you shift your attention in other directions.

This too is an enormous over-simplification, and one can find a number of thoughtful officials in the Clinton administration, as well as many of its constructive critics, who understood the times and who sensed the impending dangers, e.g., catastrophic terrorism and the new vulnerability of the American homeland. Prior to 11 September 2001, however, their activities proceeded as a largely academic exercise. Within official government circles, thinking still was couched in terms of deterrence. As William S. Cohen, the secretary of defense during President Clinton's second term, wrote in November 1997:

> As the new millennium approaches, we face the very real and increasing prospect that regional aggressors, third-rate armies, terrorist groups and even religious cults will seek to wield disproportionate power by acquiring and using these weapons [nuclear, chemical, biological] that can produce mass casualties. These are neither far-fetched nor far-off threats… There is no single defense against this threat… President Clinton has directed the Pentagon to intensify efforts in three mutually reinforcing areas: to prevent the proliferation of these deadly weapons; *to deter such attacks against the United States and its allies*; and to prepare our forces to fight and win in the face of chemical and biological attack (emphasis added).[7]

Unlike Europe during the 1990s where military investments shrank and priorities turned to domestic programs, the United States retained a more balanced approach and continued to build its military strength around an array of revolutionary

7 William S. Cohen, "In the Age of Terror Weapons", *The Washington Post,* November 26, 1997, p. A19.

technologies as envisioned in Joint Vision 2010 and 2020. The American grand strategy during the 1990s was by any account broad and unfocused. It embraced new themes (e.g., counter-proliferation) while retaining old themes (e.g., a largely bipolar concept of strategic stability). In the 1994 Nuclear Posture Review and in PDD 60, nuclear deterrence remained important, at the same time that nuclear weapons continued moving away from the center of American military strategy, something that had been in motion since the early 1990s. Despite serious attempts in the United States to recalibrate nuclear deterrence, it still was understood largely within the old intellectual framework, mainly as a hedge against the possibility that a new Russian threat might emerge. Much the same can be said for strategic stability and the importance ascribed to the ABM Treaty. The last National Security Strategy document issued by the Clinton White House (December 1999) and the last joint communiqué between President Clinton and his Russian counterpart (June 2000) reflected this reality, as did the nuclear portion of NATO's new strategic concept (April 1999). This was the situation at the dawn of a new century, as Americas went to the polls to vote for a new American president in November 2000.

Early in the presidential campaign, Condoleezza Rice, a key adviser to Governor George W. Bush who was seeking the Republican nomination for the presidency, contributed an article to *Foreign Affairs* on what a new foreign policy would look like if Governor Bush (the son of the 41st president of the United States) was elected to be the 43rd president. This article, which forecast some of the major themes that would later appear in the White House National Security Strategy of September 2002, differed in one crucial respect: it stressed that the first task of a new Republican administration would be "to ensure that America's military *can deter war* (emphasis added)" .[8] Deterrence still was the dominant idea across the board.

After having won one of the closest and most unusual presidential elections in American history, George W. Bush assumed office in January 2001. His personal lack of experience in foreign affairs was offset by the experience of his national security team: Dick Cheney as vice president, Condoleezza Rice and Steve Hadley at the NSC, Colin Powell and Richard Armitage at State, Donald Rumsfeld and Paul Wolfowitz at Defense, and by official advisors to the administration, especially Brent Scowcroft (chairing the President's Foreign Intelligence Advisory Board) and Richard Perle (chairing the Defense Policy Board). Supporting the new administration one of course found the professional military, diplomatic, law enforcement, and intelligence arms of the government. And in the background, with privacy preserved for obvious political reasons, there was the close tie between George W. Bush and his father, the former president.[9]

From the perspective of the new administration, the threat environment prior to September 11 appeared to be something like the following. With respect to Russia, the

8 Condoleezza Rice, "Promoting the National Interest", *Foreign Affairs* (January/February 2000), p. 46.

9 See James Gerstenzang and Sonni Efron, "President Critical Choices in Foreign Policy Have the Imprint of Some Fatherly Advice", *Los Angeles Times*, October 7, 2002.

defense policies and deterrence assumptions of the Clinton administration were seen as part of the problem in keeping the U.S. and Russia from evolving toward a more productive strategic partnership. To make Russia a true partner, one had to cease acting as if Russia was a potential enemy. American deterrence planning should no longer be dominated by this possibility.

The Chinese case was more complicated. China, still a Communist state, was slowly and steadily modernizing its nuclear forces. The potential for an armed confrontation with China over Taiwan remained, and China's long-term aspirations in its region were uncertain. American deterrence planning for China was seen as relevant to the strategic circumstances. Exactly what such planning should involve remained at an early stage of development, while many neoconservatives calling for a confrontational policy toward China.[10]

At the top of the list of rogue states for the incoming Bush administration were Iraq, North Korea, and Iran. One major concern with respect to such states was that once they acquired nuclear weapons, they might miscalculate that they could act more freely in pursuing regional aggressions because the United States would be deterred from intervening. While deterrence should enter into policy and military contingency planning for dealing with such states, many experts came to the conclusion that it was a mistake to assume that the same intellectual construct of deterrence carried over from the Cold War could or should apply.[11]

Finally, with respect to non-state terrorism prior to September 11, including the possibility of terrorists armed with WMD, this was recognized as a growing threat. However, how to deal with it and whether it could be deterred (by, for instance, denying sanctuary in existing states) still were open questions at the start of the new Bush administration.

Prior to September 11, the new national security team had made substantial progress in recasting the debate on nuclear deterrence. In the context of the major studies underway at the Defense Department—especially the *Quadrennial Defense Review*

10 Bill Gertz, columnist for *The Washington Times*, expressed a view typical of American neoconservatives when he wrote in 2000: "A fundamental lesson of the twentieth century is that democracies cannot coexist indefinitely with powerful and ambitious totalitarian regimes. Sooner or later the competing goals and ideologies bring conflict, whether hot war or cold, until one or the other side prevails. This central lesson must be learned before we can even begin to understand the China threat. Unfortunately, President Bill Clinton and his advisers have proved to be slow learners". *The China Threat: How the People's Republic Targets America* (Regnery Publishing, Inc., 2000), p. xi.

11 For a representative sample of the American thinking on nuclear deterrence issues, across political affiliations, that preceded the new Bush administration, one is invited to review: Hans Binnendijk and James Goodby, *Transforming Nuclear Deterrence* (National Defense University, Institute for National Strategic Studies, 1997); *Final Report on U.S. Nuclear Policy in the 21st Century* (National Defense University, Center for Counterproliferration Research, and Lawrence Livermore National Laboratory, Center for Global Security Research, 1998); *Report of the Defense Science Board Task Force on Nuclear Deterrence* (October 1998); and *Rationale and Requirements for U.S. Nuclear Forces and Arms Control* (National Institute for Public Policy, 2001).

(QDR)[12] and the *Nuclear Posture Review* (NPR)[13]—deterrence was identified as one of four goals: assure (referring mainly to American alliance commitments), dissuade (understood to mean discouraging potentially hostile nations from attempting to match American military power or acquire WMD), deter, and defeat/defend. Military planning was restructured from a threat-based to a capabilities-based perspective, and accounting for the possibility of being surprised was elevated as a planning assumption. During the presidential campaign, the Bush team had made it clear that they intended to develop missile defenses, and at the Ljubljana summit between Presidents Bush and Putin in the summer of 2001, a dialogue began that led, eventually, to American withdrawal from the ABM Treaty without massive damage to U.S.-Russian relations, and to the Treaty of Moscow in May 2002. The march toward this new relationship (characterized by one senior defense official as the demise of mutual assured destruction) was well underway prior to September 11[14].

American Deterrence Thinking After September 11

On Tuesday morning, September 11, nineteen members of Osama bin Laden's Al Qaeda terrorist network hijacked four large jet passenger aircraft. Two aircraft crashed into and destroyed the World Trade Center in New York, a third heavily damaged the Pentagon, and a fourth on a vector toward Washington (with likely targets suspected to be the White House or the Capitol) crashed in flames in rural Pennsylvania after its passengers heroically fought to regain control of the aircraft. By the time the second aircraft crashed into the World Trade Center, President George W. Bush already had concluded that the United States was under attack and was at war.

In the early hours of the attack, with inevitably conflicting information pouring into government crisis centers, Vice President Cheney evacuated to the Presidential Emergency Operations Center underneath the White House—a bunker built during the Cold War to withstand nuclear attack. The President went airborne and was joined by a fighter escort. His aircraft first was diverted to Barksdale Air Force Base in

12 The QDR, which was released publicly on 30 September 2001, is unclassified and is available on the official Defense Department website, at www.defenselink.mil. Secretary of Defense Rumsfeld explained the thrust of the QDR in a number of forums, including a major speech at the National Defense University in January 2002 and in an article in *Foreign Affairs* in the May/June 2002 issue.

13 The NPR is a classified document. Selected results were briefed publicly at the Pentagon in January 2002, one day after a classified briefing was presented to Congress. The Pentagon briefing is available at www.defenselink.mil. In March 2002, what purported to be the content of the classified briefing to Congress and major portions of the NPR were leaked to the media. The Pentagon refused to confirm or deny the veracity of those leaks. One of the best sources for understanding the NPR is an excellent monograph authored by Kurt Guthe, *The Nuclear Posture Review: How is the "New Triad" New?* (Washington DC: Center for Strategic and Budgetary Assessments, 2002).

14 In testimony on the NPR, Under Secretary of Defense for Policy Douglas Feith said, "If there'a a headline for the *Nuclear Posture Review*, it is that the days of MAD [mutual assured destruction] are over and unlamented. We are closing the history books on the Cold War balance of terror." Transcript of Senate Armed Services Committee Hearing on the Results of the *Nuclear Posture Review*, February 14, 2002, p. 13.

Louisiana and then to Offutt Air Force Base in Nebraska where the President, from the underground command center, convened a secure video meeting of the National Security Council. Later that evening, as no further attacks unfolded, the President returned to Washington.

During the Cold War, sending the president in a crisis to the central planning and command center for America's strategic nuclear forces would have sent a powerful signal. Now the world was different, no nuclear signal was intended, and no significant concerns were raised that the President's presence at the heart of his nuclear forces might be misinterpreted, especially by the Russians. Indeed, President Putin was the first foreign leader to reach President Bush by telephone after the attack, to express concern and solidarity.

On Wednesday, 12 September, the United Nations Security Council unanimously adopted Resolution 1368, unequivocally condemning the terrorists attacks and reiterating a standing position that acts of international terrorism are a threat to international peace and security. The United States did not intend, however, to wait for further Security Council action before proceeding with its own active defense. After the briefest of floor debates, the U.S. Congress passed a joint resolution on Friday, 14 September, authorizing the President "to use all necessary and appropriate force against those nations, organizations, or persons he determines planned, authorized, committed, or aided the terrorist attacks that occurred on September 11, 2001, or harbored such organizations or persons, in order to prevent any future acts of international terrorism against the United States by such nations, organizations or persons".[15] Planning already was underway in the still-burning Pentagon for the first phase of the war on terror.

When President Bush went to Capitol Hill on Thursday, 20 September, to address an emotionally charged joint session of Congress, he faced a vastly different Congress and nation than had greeted his inaugural address eight months earlier, when many pundits still questions whether, after the close election, he would have a sufficient mandate to govern. The resolve and solidarity of the American people appeared to many observers on 20 September 2001 to be stronger than at any time in the living memory of most Americans. "Our war on terror begins with Al Qaeda," the President asserted in strong, measured tones, "but it does not end there. It will not end until every terrorist group of global reach has been found, stopped and defeated".

Over the next year, as the war on Al Qaeda progressed and a broad dossier was compiled on Al Qaeda ambitions to acquire and use WMD, a new American defense doctrine began coalescing. It rested on the premises that co-existence with terrorists like Al Qaeda was impossible and that such terrorists could not be deterred but must be defeated. This led to the conclusion that the United States could not wait for terrorists to act before reacting but must prepare to act preemptively. Through a succession of speeches and documents in 2002—the State of the Union address in January, the West Point graduation address in June, the President's address to the

15 "Text of Joint Resolution," *The Washington Post,* September 15, 2001, p. A4.

United Nations General Assembly and the new White House National Security Strategy in September—the new doctrine was refined and sharpened. For the remainder of the paper, I will explore what this doctrine means for contemporary American thinking on deterrence, and what some of the major implications are for nuclear deterrence issues in the post September 11 world.

Deterrence and Terrorists

Prior to September 11, Osama bin Laden and the Al Qaeda terrorist network were one threat among many that the U.S. Government worried about. The bombing of the World Trade Center in February 1993, the Aun Shinrikyo sarin gas attack in the Tokyo subways in March 1995, the truck bombing of the U.S. army barracks in al-Khobar, Saudi Arabia in June 1996, and the bombings of the U.S. embassies in Kenya and Nairobi in August 1998 were some of the incidents that had alerted American officials to the new dimensions of non-state terrorism. Some actions were tried without much success as, for instance, in August 1998 when the U.S. aunched cruise missiles against the Khost training camp in Afghanistan based on a report that senior Al Qaeda leaders were about to assemble there, and against the Al Shifa pharmaceutical plant in Sudan which was suspected of producing chemical agents for terrorists. As a general proposition, however, the priority and attention given to dealing with terrorism was relatively low before September 11.

In the days and months following September 11, it became clear to American officials that global terrorists were capable of long-term, well-planned campaigns, that they were dedicated to destroying the United States and what it stood for, that they could do great damage even on the American homeland, and that they could recruit and sustain over a long period of planning agents willing to commit suicide.[16] That, coupled with a massive amount of new evidence on the terrorist efforts to acquire WMD, led to the conclusion articulated by the President at West Point in June 2002:

> For much of the last century, America's defense relied on the Cold War doctrines of deterrence and containment. In some cases, those strategies still apply. But new threats require new thinking. *Deterrence – the promise of massive retaliation against nations – means nothing against shadowy terrorist networks with no nation or citizens to defend. Containment is not possible when unbalanced dictators with weapons of mass destruction can deliver those weapons on missiles or secretly provide them to terrorist allies...* If we wait for threats to fully materialize, we will have waited to long… [T]he war on terror will not be won on the defensive. We must take the battle to

16 For an overview of the type of thinking about Al Qaeda that underlies American policymaking, see "Anonymous", *Through Our Enemies' Eyes* (Brassey's Inc., 2002). The author, "Anonymous", is identified by the publishers as a senior U.S. intelligence official with nearly two decades of experience in national security issues related to Afghanistan and South Asia.

> the enemy, disrupt his plans, and confront the worst threats before they emerge (emphasis added).[17]

This mode of thinking was at the center of the National Security Strategy document that was released by the White House three months later. The prospect of a nuclear weapon detonated by Al Qaeda operatives on the mall in Washington or in New York City is, in this view, a clear and present danger, if and when Al Qaeda acquires such weapons. And given the magnitude of the intelligence problem, there is no assurance that the United States would have warning of that event. It is impossible to overstate how important this conclusion is in driving American strategic thinking today.

Deterrence and Rogue States

Many Europeans have objected to the phrase 'rogue state'—a phrase coined in America to identify problem states like Iraq, North Korea, and Iran. Rogue states are identified by the Bush administration by five criteria:

- They brutalize their own people and squander national resources for the personal gain of the rules;
- They disregard international law, threaten their neighbours, and callously violate international treaties to which they are party;
- They are determined to acquire WMD and other advanced military technologies to use as threats or in support of aggression;
- They sponsor terrorism around the globe;
- They reject basic human rights and hate the United States and everything it stands for.[18]

There are some dissuasion and deterrence issues in general and nuclear deterrence issues in particular that are common to Iraq, Iran, and North Korea. For instance, one common question is how to assure compliance with non-proliferation obligations undertaken by these states. After a month's debate, the U.N. Security Council on 8 November 2002 adopted a new resolution, 1441, strengthening the inspection regime for Iraq and giving Baghad "a final opportunity" to comply with its disarmament obligations. As this paper is being completed, U.N. inspectors have re-entered Iraq for the first time since 1998 to begin their inspections. It is inconceivable that this new resolution would have been passed in the present climate had the United States not taken a strong stand that if the international community lacks the will to disarm Iraq, the U.S. was prepared to assemble a coalition to take military

17 President Bush's Remarks to the Graduating Class at West Point can be found at www.whitehouse.gov.

18 The White House, *The National Security Strategy of the United States* (September 2002), p. 14.

action based on the principle of self-defense to accomplish that task.[19] That remains the American position.

To complicate the issue further, while the Iraqi case dominated headlines, senior North Korean authorities now have admitted for that they are in violation of the 1994 Framework Agreement and have acquired nuclear weapons.[20] The U.S., at least for the moment, is pursuing a diplomatic strategy for dealing with the North Koreans.

One deterrence issue common to regional scenarios in which an aggressor possesses WMD is how to prevent him from first using WMD or, if he initiates WMD use, from escalating from initial to more widespread use of these weapons. This is a deterrence question that was addressed on many occasions during the Cold War. What one finds in comparing the Cold War situations to today's world is that one must take the cases separately, looking carefully at the personalities of decision makers in separate instances, at their motivations and understandings, and at the specific circumstances of different cases. In the case of Iraq and Saddam Hussein, for instance, American analysts have gained a more better understanding of his strengths and weaknesses over the years. Kenneth Pollack, a former CIA analyst and director of Gulf Affairs on the Clinton NSC staff, currently a senior fellow at Brookings, makes a compelling argument on why it is risky to count on deterring Saddam Hussein:

> The problem of Saddam Hussein is not that he is irrational or suicidal; the problem is that he is a serial "miscalculator". He is aggressive and risk-taking by nature, and what we have found, watching him in power for 34 years, is that faced with a difficult situation, Saddam Hussein will interpret reality in ways that accord with what he wants to have happen—often regardless of how bizarre or fantastic his conclusions are. And in fact, time and again we have found that other senior Iraqis

19 When asked on NBC's Meet the Press on 15 September 2002 what basis there was in international law for the U.S. to take military action unilaterally against Iraq, Secretary of State Colin Powell cited the inherent right to self-defense within the UN Charter. For a discussion of the current state of international law on "anticipatory self-defense", see chapter five in Anthony Clark Arend and Robert J. Beck, *International Law and the Use of Force* (Routledge, 1993). Professor Arend expanded on this in a briefing sponsored by The American Society of International Law at the Society's headquarters in Washington, DC, on 1 August 2002. At that briefing, he called the audience's attention to an article written by U.S. Government attorney Guy B. Roberts, "The Counterproliferation Self-Help Paradigm: A Legal Regime for Enforcing the Norm Prohibiting the Proliferation of Weapons of Mass Destruction", *Denver Journal of International Law and Policy* (Summer 1999), pp. 483-539.

20 North Korean Deputy Foreign Minister Kang Sok Joo furst communicated the message to American Assistant Secretary of State James Kelly on 4 October 2002 during the first high-level official talks between the new Bush administration and the North Korean government, in Pyongyang, the North Korean capital. According to American officials in the room at the time, the North Koreans were unapologetic and assertive in making the revelations. Richard Boucher, spokesman for the U.S. State Department, revealed the situation in a statement issued Wednesday, 16 October 2002, and indicated that the Bush administration was consulting with its allies and with key members of Congress. As this paper goes to press, a number of diplomatic initiatives continue for dealing with North Korea.

> around Saddam have greatly disagreed with Saddam's own assessments of the situation and the likelihood of success in some of his more outrageous adventures. But none of them has been in a position to tell him that it was a mistake to do so, because Saddam has a bad habit of shooting the messenger.[21]

Beyond a propensity to be generally uninformed about the West, to miscalculate, and to brutalize advisers that tell him what he does not want to hear (a trait, incidentally, that Kim Jong Il appears to share with Saddam Hussein), there always is the likelihood that if a regional war breaks out and the aggressor appears on the verge of being killed or captured, he will strike out with WMD regardless of the consequences. There is a clear logic to this argument, but it does not mean that deterrence remains irrelevant. For WMD to be used, others must transmit and/or comply with the orders, and they thus become appropriate objects of deterrence. In his speech at Cincinnati, Ohio, in early October, laying out the rationale for the current showdown with Iraq, President Bush addressed himself to the Iraqi military saying that if Saddam Hussein orders "cruel and desperate measures" (obvious shorthand for chemical or biological attacks), Iraqis would be well advised to refuse those orders or they would be pursued and punished as war criminals.[22] Secretary of Defense Rumsfeld was even more explicit several days later, as reported by the American journalist David Broder: "But he can't use them himself. He has to have other people use them, and that means somebody has to obey orders. And already word has gone out that anybody who goes near those weapons or follows such orders…would be tracked down and charged with war crimes".[23]

This raises the interesting question of whether first use of chemical or biological weapons will be considered a war crime in and of itself, and what that portends for international attitudes toward first use of nuclear weapons. It also leaves open the question of how to respond to first use of WMD by a regional aggressor (other than simply fighting the war to a decisive conclusion and holding war crime trials). In the early 1990s, in a study on the role of nuclear weapons in the new world order, provided to the Senate Armed Services Committee, Thomas Reed and I argued that we were not prepared, as some were at the time, to categorically reject any role for American nuclear weapons in regional conflicts since it was not difficult to entertain nightmarish visions in which Saddam Hussein (or a similar aggressor) threatens American forces abroad, American allies or friends, and perhaps even the United States itself with WMD. That argued not for early or casual reliance on an American nuclear response, but for the serious realization that there may be instances in which

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21 See the interview with Kenneth Pollack, 4 October 2002, "Invasion Key to Keeping Nukes from Hussein, U.S. Expert Says", *Washington File*, 9 October 2002, http://usinfo.state.gov/cvi-bin/washfile. For a more extensive account of Pollack's argument, see chapter 8, "The Dangers of Deterrence", in his recent book *The Threatening Storm: The Case for Invading Iraq* (Random House, 2002).

22 President George W. Bush, Remarks on Iraq, October 7, 2002, http://www.whitehouse.gov.

23 David S. Broder, "Rumsfeld's Rush", *The Washington Post*, Wednesday, October 16, 2002, p. A25.

nothing but the threat or use of nuclear weapons might stop an escalating chain of massive biological or chemical attacks.[24]

The appropriate response to enemy first use of WMD continues to be a topic of discussion in American strategic studies circles, with an increasing focus on whether the United States has the proper nuclear arsenal to keep from being self-deterred in such instances because of fear that an American response with nuclear weapons optimized for Cold War targets might, in a regional contingency, indirectly cause excessive civilian casualties if used to attack WMD facilities or forces.[25]

Aside from this capabilities issue, however, perhaps the hardest deterrence question raised by the proliferation of WMD to rogue nations is that posed by Michael Quinlan: "Sound deterrence flows from military capability and political stance as a whole, underpinned by a flexible synergy of options. Its basic currency should be outcomes rather than instruments. Should its efficacy fall into doubt, what is most needed, as experience from Cuba to Kuwait suggests, is improved clarity not about types of military reaction, but about the limits of political acceptability—what we would fight for, not how we would fight…".[26] That, unfortunately, is the difficult question the proliferation debate currently is addressing for Iraq and may soon have to address for North Korea. What is the world community willing to fight for if, notwithstanding heroic diplomatic and arms control efforts, a rogue government insists on acquiring nuclear weapons?

Deterrence and Major Powers

The recent NPR sought to broaden the array of capabilities underlying deterrence to include nuclear and non-nuclear offensive forces, active and passive defenses, and the infrastructure supporting the U.S. nuclear posture.[27] This is a generic construct, and the details of how all the elements are to come together in an overall deterrence policy still is being explored. The NPR should be viewed as a part of the wider military strategy articulated in the QDR and further elaborated in the Secretary of Defense's Annual Report to the President and the Congress, released publicly on 15 August

24 Our prepared statement on Thursday, January 23, 1992, to the Senate Armed Services Committee can be found in the Committee print, *Hearings on Threat Assessment, Military Strategy, and Defense Planning*, Senate Hearing 102-755 (U.S. Government Printing Office, 1992), pp. 93-9. The report entitled *The Role of Nuclear Weapons in the New World Order* is reproduced in the same Committee print, pp. 156-213.

25 For a flavor of the ongoing American debates on how capabilities intersect deterrence, see Stephen M. Younger, *Nuclear Weapons in the Twenty-First Century* (Los Alamos National Laboratory, June 27, 2000); C. Paul Robinson, *Pursuing a New Nuclear Weapons Policy for the 21st Century* (Sandia National Laboratories, March 21, 2001); and Carl Poppe *et. al*., "*Whither Deterrence?" A Brief Synopsis* (Lawrence Livermore National Laboratory, May 2002).

26 Sir Michael Quinlan, Letter to the editor, printed in IISS, *Survival* (Winter 1995-96), p. 190.

27 Assistant Secretary of Defense for International Security Policy, J.D. Crouch, Special Briefing on the *Nuclear Posture Review*, The Pentagon, Wednesday, January 9, 2002. http://www.defenselink.mil.

2002.[28] The intellectual framework within these documents is one that refocuses military planning away from specific adversaries (as was common during the Cold War and in the first post-Cold War decade), toward what is called "capabilities-based" planning. This approach logically leads one to ask the question of what capabilities are needed to deter a great power that becomes a peer competitor of the United States, regardless of that power's identity.

In one sense, September 11 merely reinforced what already was a decision of the Bush administration to reconstruct the U.S.-Russian strategic relationship on the premise that deterrence ("mutual assured destruction") should not continue to define that relationship. Of course one can argue abstractly that so long as the United States and Russia have the nuclear capabilities to destroy one another, some form of residual deterrence must define the relationship. Abstractly, one also could make that argument about America's relationship to Britain and France. The thrust of the new American policy appears to be a political decision to work with Russian more like America works with allies like Britain and France and less like an enemy, making the issue of deterrence irrelevant. Whether that will in fact succeed remains to be seen. Whatever the case, *assurance* has become a more important concept for America's relations with great powers such as Britain, France, and Russia, with *deterrence* relegated to the background.

As for China—the other country that could conceivably become a peer competitor of the United States someday—the events of September 11 appear to have delayed the debate over how the United States should recast its deterrence policy if (1) China does take the decision to become a hostile peer competitor, and (2) China is not dissuaded from seeking over several decades to match, if not exceed, American military power. For the moment, this is not a major issue and an American policy of engagement with China appears to be the preferred course. How America deploys its missile defenses and how China responds is one part of this calculus. Another is the uncertainty over the future of Taiwan and whether that again will become a flashpoint. Even if the Taiwan issue eventually is resolved peacefully, there remain the questions of America's military presence in Asia, of the future of the Korean peninsula (with the new overtones of North Korea in effect declaring that it has nuclear weapons), of Japan's future decisions on nuclear weapons, on how the major powers in Asia react to the continuing tensions created by nuclear weapons in India and Pakistan, on the unfolding events of global terrorism in Asia, on Australia's decisions regarding its own security consequent to the terrorist bombing in Bali and the North Korean nuclear moves, and a host of related questions. All of these raise potential nuclear issues which could refocus American policy on deterrence regarding the region. For now, *dissuasion* appears to be a more important element of the American power calculus for dealing with China than does *deterrence.*

28 This document also is available at http://www.defenselink.mil.

Concluding Observations

In prepared remarks delivered in New York City shortly after publication of the new American National Security Strategy, National Security Adviser Condoleezza Rice said: "The National Security Strategy does not overturn five decades of doctrine and jettison either containment or deterrence. These strategic concepts can and will continue to be employed where appropriate".[29] What I have attempted to identify in this paper are some central themes of a dialogue in the United States that began in the days after World War II, continued throughout the Cold War, carried over to the decade of the 1990s, and has become even more relevant after September 11, on how to conceive deterrence in general and nuclear deterrence in particular. This is not an American dialogue alone but one that engages the United States with friends and allies, enemies (present and potential), and a host of other governments throughout the world.

At the moment, the American nuclear posture has receded from the center of American strategy but remains critically important because of the conviction that some challenges may not be capable of being met absent the shadow of nuclear deterrence, and the equally strong conviction that the future is highly uncertain in ways which counsel retaining the ability to reinvigorate and redirect nuclear deterrence on short notice. In both senses, the nuclear deterrent posture has become a reserve as identified by Clausewitz, a force to counter unforeseen threats. Clausewitz distinguishes tactical reserves from strategic reserves. The question of whether America needs nuclear deterrence to cope with WMD use by regional aggressors approximates to what Clausewitz calls a tactical reserve. As for strategic reserves, Clausewitz argues that "there can be such a thing as a strategic reserve, but only when emergencies are conceivable," and that it is "an essential condition of strategic leadership that forces should be held in reserve according to the degree of strategic uncertainty".[30] Given the turbulent nature of world politics today and its uncertain future, the U.S. appears to view its nuclear posture in part as this kind of strategic reserve.

Does this mean that the United States is abandoning its commitments to Article VI of the Nuclear Nonproliferation Treaty (NPT) toward eventual nuclear disarmament? I do not believe it does. Since the United States first proposed the Baruch Plan in 1946, one of the stickiest problems for any nuclear disarmament plan is how to insure security that others do not cheat, since the strategic consequences of others covertly acquiring even a few nuclear weapons if you have voluntarily disarmed are categorically important. Before the international community again sorts out how and at what pace to expect progress in complying with Article VI, a reasonable solution to the challenges to nonproliferation posed by nations such as Iraq and North Korea

29 Remarks by Dr. Condoleezza Rice, Assistant to the President for National Security Affairs, to the Manhattan Institute's Wriston Lecture, October 1, 2002, p. 2. http://www.whitehouse.gov.

30 Carl von Clausewitz, *On War,* edited and translated by Michael Howard and Peter Paret (Princeton University Press, 1976), p. 210.

must be met. That is an enormous political undertaking. Let us hope it is concluded successfully.

THE NUCLEAR BALANCE OF TERROR AND SEPTEMBER 11

Brad Roberts[*]

The implications of the nuclear revolution for the functioning of the interstate system have been a matter of intense debate since the first use of nuclear weapons more than five decades ago. The "balance of terror" is shorthand for the version of stability that was understood by analysts and policymakers to dominate the relations among the major nuclear weapon states through the cold war era. With the end of the Cold War, this landscape began to give way to new dynamics, as more fluid political relations among the major powers emerged and as uncertainty about their nuclear relations increased. What impact has September 11 had on this shifting landscape?

At first blush, the short answer would appear to be, "not much". After all, as a war between a non-state entity and a civilization, the war does not seem to invoke any of the classic issues of nuclear deterrence and warfighting. Moreover, so far at least the attacks of September 11 have had the effect of drawing the established nuclear weapon states closer together, by highlighting common interests and common responsibilities.

The purpose of this brief discussion paper is to look beyond this short answer. A central proposition is that the events unleashed by the attacks of September 11 have indeed had some important effects on the global nuclear problem. This paper is divided into two sections. The first explores the potential role of nuclear weapons in the present conflict. The second explores the impact of September 11 on some broad trends in the post-cold war nuclear landscape. A discussion paper is by design intended to stimulate debate and reflection and not to offer the definitive, last word. This paper is aimed at stimulating provocative thinking about the new nuclear landscape.

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WMD in the Present Conflict

The present conflict has two primary dynamics. One dynamic is the war by Al Qaeda and its supporters on the West (and the rest). The other is the dynamic between Saddam Hussein and the United Nations and the United States. Each presents different possibilities for the use of weapons of mass destruction.

Concerning Al Qaeda's potential use of weapons of mass destruction, we must recognize that it is simply too early to tell whether it will do so. Clearly, the "first shot" of September 11 is not the "last shot" (indeed, September 11 was most evidently not the "first shot"). The attacks of September 11 certainly signaled a virtually unprecedented willingness to exact casualties on a massive scale (the one previous exception being the attempted and planned mass casualty attacks of Aum Shinrikyo). They also signaled a technical and operational capacity to undertake attacks of unprecedented complexity. On the other hand, Al Qaeda leadership appears also to have been concerned about not letting the attacks generate consequences beyond their control. Reportedly, one captured Al Qaeda planner has explained the decision not to attack nuclear power plants that day as due to the reluctance to do things that could then "get out of control". At this writing in autumn 2002, it remains an open question whether the leadership of Al Qaeda feels that it is necessary to exploit weapons of mass destruction and to exploit them for their full lethal potential in the attempt to regain the initiative in its war against the West. We must recognize the very different consequences associated with their uses of such weapons for purposes of harassment and fear-mongering as opposed to those uses aimed at reaping the full lethal potential of these weapons to kill millions.

The role of Western nuclear weapons in deterring or retaliating for Al Qaeda WMD attacks has been largely disparaged. Indeed, in Washington policy circles there has been much despair that America's most powerful strategic tools appear irrelevant to the effort to deter mass casualty attacks by Al Qaeda and its supporters. This despair has helped to reinforce the sense of urgency about improving the ability to manage the consequences of such attacks, while also reducing vulnerabilities and improving the ability to prevent attacks. In considering the possible role of nuclear weapons for use in retaliation, analysts and policymakers quickly recognized that such forms of punishment could play into the hands of Al Qaeda. Indeed, there is some belief that Al Qaeda might find it useful to try to bait the United States and/or Israel into using their nuclear weapons, in the belief that this would galvanize its constituencies to undertake to oust Westerners and Jews from the Arab and Islamic word.

In considering Al Qaeda's potential "uses" of weapons of mass destruction, it is important to look beyond these terrorist style uses to consider what might happens when and if the movement succeeds in gaining control of a state. There is reason to think that those uses might come closer to our traditional notion of balance of power politics played under a balance of nuclear terror. If this comes to pass, the new deterrence problem may look to Western policymakers much like the problem of the

1940s and 1950s as revolutionary states (the Soviet Union and China) acquired nuclear weapons at the same time that they espoused doctrines of global revolution. This was not seen as stable but it did come to be seen as manageable.

The second conflict dynamic between Iraq and the rest also holds certain WMD and thus nuclear risks. Iraqi use of chemical weapons is treated at this writing as nearly a foregone conclusion—if war comes. Its use of biological weapons also seems a distinct possibility, not least because a war of regime removal brings us face-to-face with the very purpose for which Iraq created and deployed such weapons a decade ago. If Iraq succeeds in using these weapons to generate mass casualties, questions of the necessary nuclear reply by the United States (and potentially others) would necessarily be on the table. If Iraq is seen to be able to follow initial WMD attacks with forms of escalation that would drive the deaths into the millions, then the pressures to use nuclear weapons to seek an early and prompt end to that particular threat could be considerable.

In surveying these possibilities, it seems likely that the present conflict may yet turn out to involve the use of weapons of mass destruction. The sustained use of such weapons by Iraq in campaign-style attacks to achieve tactical, operational, and strategic objectives would be a watershed event, as would any nuclear reply such use might generate. In its own terms, this prospect is awful enough. But let us put this in historical terms as well. In the 20th century, nearly 40 million people died in wars. Another approximately 190 million died at the hands of state power. If the 21st century opens with a major WMD war, what precedent will have been set? And what record will be written of a century's death toll one hundred years from now?

Beyond the Present Conflict to the Broader Global Nuclear Landscape

The potential impact of September 11 on matters of nuclear deterrence is not limited, however, to the potential role of nuclear weapons in the present conflict. That conflict has unfolded against a broader global nuclear landscape, one that has been in considerable flux since the end of the Cold War. For purposes of argument, this paper highlights three main trends in that landscape. It then considers the impact of September 11 on those trends.

Trend #1: From Deterrence to Assurance

Over the four decades of the Cold War, nuclear weapons became synonymous with deterrence. Over time their war-fighting purposes withered away and the nuclear weapon states were each left with their essentially unusable "deterrents". Today, it is difficult to see that nuclear weapons play much of a deterrence role in major power relations. After all, the risks of war among them are at an all time low. Moreover, where the risk of war remains, as for example across the Taiwan Strait, the confrontations under the nuclear shadow that can be conceived bear almost no resemblance to the problem of Armageddon that centrally preoccupied nuclear strategists for decades.

Yet the nuclear weapon states continue to attach considerable security value to their nuclear weapons. If that value derives very little from their contributions to deterrence, what is its source? There is a good argument that the nuclear weapon states increasingly value their nuclear capabilities for their self-assurance function. The existence of these capabilities helps to ensure the major powers that their vital interests will not be jeopardized by foreign aggressors and that there will be no dramatic changes in the international environment with which they cannot cope. Moscow is assured that it will count where its vital interests are at stake. Beijing is assured that it will not again be victimized by predatory major powers and will be taken seriously as a rising power. Both are assured that they will not be victimized by U.S. hegemony—or by nearby rising powers. Washington is assured that there will be no sudden collapse in the relative peace prevailing among the major powers. All of the nuclear weapon states are assured that violent changes to the international order will be the exception rather than the rule. In sum, their nuclear weapons are a kind of hedge against uncertainty.[1]

Today among The Five there appears to be an increasing convergence of thinking about the desire to move away from MAD and toward minimum deterrence postures, although to be sure thinking has not fully converged here. Arguably, the United States has gone less far than others in this direction, but even the recent U.S. Nuclear Posture Review envisions a further eclipse of nuclear tools by other instruments of military power (e.g., non-nuclear strike and ballistic missile defense).

What impact did September 11 have on this trend? Perhaps most strikingly, September 11 did not abort it. So shocking a blow to U.S. national security, and the dramatic signal of a rising conflict between radical Islamists and Western civilization, might reasonably have been expected to generate a reembrace of nuclear deterrence. But this has not happened. Nuclear weapons are not central to the U.S. strategy of war against Al Qaeda, not least because of the simple fact that non-state actors possess none of the attributes of states that can be held hostage by nuclear threats. Moreover, September 11 may well accelerate the trend—if military assets other than nuclear ones come to be seen as the essential strategic tools to the unfolding conflict. Special operations forces, for example, seem likely to prove far more decisive than nuclear weapons.

Trend #2: From Bipolarity to Something Messier

It is a truism that the end of the Cold War brought with it the end of the bipolar nuclear confrontation. Strategists have been casting about ever since to find a new organizing principle to characterize the dynamics of the new nuclear era. "Multipolar" is of course a tempting word, and "multipolarity" has been embraced as

1 These arguments are drawn from Brad Roberts, *Nuclear Multipolarity and Stability,* IDA Document D-2539 (Alexandria, Va.: Institute for Defense Analyses, 2000). This document is available electronically at the website of the agency that sponsored the work, the Defense Threat Reduction Agency (www.dtra.mil).

a desired goal by the French government. In fact, there seems to be no simple shorthand to accurately characterize the messiness around us.

It is useful to think in terms of different levels of analysis. At one level is the major power core—the relations among the established nuclear weapon states. At this level, a not entirely bipolar structure has given way to something that appears increasingly tripolar in character. The strategic postures and decision-making of Washington, Moscow, and Beijing appear to be increasingly interconnected. It is premature to argue that a tripolar system has emerged but it is not premature to note the systemic connections and the potential for a competitive form of arms race to take shape in the next decade. An interesting question relates to the changing requirements of stability in this tripolar core. In the past, concern focused on arms race and crisis stability. With the shift from deterrence to assurance and the growing emphasis on hedging strategies, a question arises about the requirements of hedging stability in a three-sided "game." Little thinking has been done on such questions.[2]

A second level of analysis is the regional subsystems. Nuclear developments in South Asia and the Middle East have clearly entered a dynamic new phase, with the emerging Indo-Pakistani nuclear competition and the Iran-Iraq challenge. Nuclear risks in East Asia, especially but not exclusively Northeast Asia, are a focus of rising concern.

A third level of analysis connects the tripolar core to the subregions. During the Cold War, these were connected by the risks of catalytic wars arising from subregions where the superpowers might become ensnared in escalating conflict because of their backing for opposing sides. In today's world, the connections are multiplying with the proliferation of long-range delivery systems. The potential nuclear competition between China and India is an essential part of this linkage. Indeed, China sits at the center of both the major power dynamic and intersections with most of the nuclear-sensitive subregions.[3]

Thus, the trend is from bipolarity to something much more complex. But the emerging picture is clear enough for us to know that Asia is emerging as an increasingly important aspect of the global nuclear dynamic, not least because of China's increasingly prominent place in the thinking of other countries about the requirements of nuclear security.

What impact did September 11 have on this trend? There are two primary consequences of note. One is that September 11 raised the specter of a potentially dramatic—and sudden—remaking of the nuclear order. This seemed increasingly possible for various reasons—the feared emergence of a nuclear-armed revolutionary

2 These arguments on tripolar stability are developed more fully in Brad Roberts, *Tripolar Stability: The Future of Nuclear Relations Among the United States, Russia, and China,* IDA Paper P-3727 (Alexandria, Va.: Institute for Defense Analyses, 2002). Also available at www.dtra.mil.

3 This framework of analysis, with its three levels, is drawn from Roberts, *Nuclear Multipolarity and Stability.*

Islamic state committed to resurrection of the Caliphate, the spread of "loose nukes" from the Pakistani arsenal to Al Qaeda or other actors, or the weakening of the bonds of extended U.S. deterrence as the United States moved aggressively and to a large extent unilaterally to make a broad war against radical Islamist forces.

The second consequence was in the tripolar core. Moscow and Beijing simply acquiesced to the new strategic framework being pursued by the Bush administration and with it U.S. withdrawal from the Anti-Ballistic Missile Treaty. Supporters of ABM Treaty withdrawal in Washington interpret their acquiescence as signaling broader agreement in Russia and China on the virtues of the vision of strategic stability elaborated by the administration. Such an interpretation may yet prove premature, although further large-scale attacks by Al Qaeda could have the effect of further consolidating Russian and Chinese support for Washington.

Trend #3: From Consensus to Dissensus on Nuclear Order

Since at least the mid-1990s there has been a gathering crisis in global political approaches to nuclear order. This crisis has multiple sources. One is the apparent stumbling and near failure of the effort embraced in the wake of the Persian Gulf War to strengthen the global treaty regimes against nuclear, biological, and chemical weapons; there is little to show for a decade of effort. Another is the chronic underperformance of the treaty regimes in dealing with compliance problems; Iraq, North Korea, and Iran continue to fester as a testament to the ineffectiveness of these regimes, as do continuing doubts about Russian and Chinese compliance with their own treaty obligations. A third factor is the chronic absence of leadership of these regimes by the United States; both the Clinton and Bush administrations have starved the treaty regimes of the fiscal, political, and intellectual capital essential to their effective functioning. There is also the manifest unwillingness to prepare seriously to pass the first test of collective security posed by a WMD-armed regional challenger, so that that test teaches the "right lessons" about the utility of those weapons and the credibility of the guarantors.

William Walker has focused on the role of the United States in building this order—and generating the present crisis: "Although many states gave shape to this nuclear order, it was seen by the United States as peculiarly *its* creation and responsibility, as the product of *its* genius, and with some justification. Throughout the nuclear age…most of the *ordering ideas,* and most of the desire to realize those ideas, came from the United States. The American attitude towards the nuclear order has therefore always been monarchical….[But] U.S. actions called into question the entire order that the US had itself so painstakingly constructed".[4]

What impact did September 11 have on this trend? Most observers would probably argue, "not much". I would argue that the sense of crisis has only deepened in the year since September 11, and largely because of concerns about how the United States

4 William Walker, "Nuclear Order and Disorder", *International Affairs,* Vol. 76, No. 4 (2000), pp. 703-724.

has interpreted the lessons of September 11 and translated them into new strategic concepts. The Quadrennial Defense Review, released shortly after September 11, did little to suggest that the U.S. national security saw nonproliferation and arms control measures as viable tools of policy or even that nonproliferation was a battle that could be won or at least not lost. *The Nuclear Posture Review* of a few months later also seemed to convey a disinterest in or even antipathy toward regimes of any kind, though with its emphasis on strategic principles of assurance and dissuasion it seemed to hint that U.S. strategic power could be used to shape the international environment in ways that reduce risks. The subsequent failure to make a political case that the initiatives embodied in the NPR are consistent with and supportive of the U.S. commitment to the nuclear nonproliferation regime has only amplified concerns.

The National Security Strategy released almost exactly one year after September 11 offers some important reassurance on this score, however. With respect to its vision of how to deal with the challenges of WMD proliferation, it is largely consistent with the thinking developed over the last decade. Indeed, the conceptual architecture and even the lexicon were first developed by Secretaries of Defense Aspin and Perry. Even preemption and preventive wars of regime change have antecedents in previous administrations. Until September 11, the administration seemed to be flirting with the idea that more proliferation was inevitable and that multilateral arms control was a dangerous illusion; with September 11, the president seems to have concluded that American cannot live in a world of broad proliferation and accordingly has embraced every tool of policy available to him to escape that world. Whether the president's vision can be translated into an effective agenda for leadership of the nuclear project remains an open question.[5]

The United States and the World Order Project

A final factor bearing on the future of nuclear order is the leadership role of the United States. It is a simple but central question: what does the United States intend? What are American ambitions on the world stage? How does it intend to exploit its moment of unprecedented and unparalleled power? These questions range far beyond consideration of the American commitment to the Nuclear Project to larger purposes and ambitions.

The Bush administration arrived in Washington with a welter of competing and sometimes conflicting answers to these questions. In the U.S. democratic system, this is a natural consequence of a party long out of power, though in the Republican Party the spread of thinking about the requirements of leadership in today's world (and even the desirability of leadership) seems especially broad. The president himself argued as a candidate that humility needed to be a central organizing principle of American foreign policy.

5 Subsequent to release of the National Security Strategy the Bush administration also issued a National Strategy to Combat Weapons of Mass Destruction (December 2002). Both documents are available at www.whitehouse.gov.

It is hardly surprising that the so-called "hardliners" in the administration saw September 11 as a vindication of their views. Having made the case that strategic surprise was likely to victimize America, they could hardly have expected better proof. Having argued that unilateralism served U.S. interests, they could now argue that the United States has the wrong allies for the hard work ahead. Having seen arms control as a dangerous delusion, they could now argue that arms control had failed to protect America from this threat. Having seen the United Nations and multilateral institutions more generally as outdated, they could now argue that there was no need to seek the endorsement of those institutions to lend legitimacy to U.S. self-defense actions. Having argued that the United States should use its power to accelerate its freedom of maneuver, they could now argue that the bold exploitation of American power to its fullest potential is the only way to escape the grim visions of WMD war sketched above.

But the National Security Strategy has dampened many of these impulses. To be sure, it still embraces as a central principle the responsibility to exercise power, even above the responsibility to exercise leadership. And it promises unilateral acts where U.S. interests require them. But it also offers a rather bold vision of cooperation among the major powers and of the ability to work through existing international institutions to defend the peace, preserve the peace, and extend the peace.

From the perspective of this discussion of matters nuclear, it is perhaps important to note that some of the most anti-nuclear elements of the Republican Party can be found in this hard-line camp. More importantly, however, the Bush strategy encompasses some important new departures in U.S. thinking. The vision of preserving the peace focuses centrally on shifting the major power dynamic from one of competition to one based on common interests, common values, and common responsibilities. Toward that end, however, the administration explicitly seeks an escape from the balance of power among the major powers. With its professed commitment to ensure military capabilities second to none, including in the strategic realm with superior nuclear and non-nuclear offensive forces as well as the intended ballistic missile defense, it intends to dissuade any potential challenger. Whether it will be possible to square this vision of strategic supremacy with the vision of a cooperative world order remains an unanswered question—and a huge one.[6]

Conclusion

Prior to the attacks of September 11, the connections between nuclear weapons and international security had entered an important new phase. Those attacks have had a substantial impact on the dynamics of this new phase. They have helped to consolidate the movement of nuclear weapons from the center of major power relations into the background, and to accelerate the shift from deterrence to assurance

6 For a further discussion of these themes, see *American Primacy and Major Power Concert: A Critique of the 2002 National Security Strategy* (Alexandria, Va.: Institute for Defense Analyses, 2002).

as a central function of nuclear weapons for the nuclear weapon states. At the same time, however, they held out a potential dramatic remaking of the global nuclear order, into something even potentially much "messier" that now in existence. The attacks accentuated questions about whether current political approaches to nuclear order, in the form of arms control and disarmament and treaty regimes more generally, would long survive—questions that the Bush administration has to a limited extent attempted to answer.

The attacks also held out the harbinger of not just the first WMD war but a new century of WMD wars—a grim, indeed horrendous prospect that too closely echoes the fears of cold war-vintage Armageddon. And the attacks of September 11 have had broad repercussions on the American debate about whether and how to lead on the world stage, debates that so far suggest a commitment to sustained leadership but with an as yet untested vision of how to do so.

NUCLEAR WEAPONS AFTER SEPTEMBER 11

Lewis A. Dunn[*]

Since their use at Hiroshima and Nagasaki, nuclear weapons have been at the heart of the global security agenda. For over four decades, nuclear deterrence was the central organizing concept of global strategic and security relationships in what had become "the nuclear age". Shaken by their journey to the brink of nuclear war in the 1962 Cuban Missile Crisis, both the United States and the former Soviet Union increasingly emphasized the primacy of deterrence. By the mid-1980s, both superpowers, as affirmed by Presidents Reagan and Gorbachev, had come to agree that "a nuclear war cannot be won and must not be fought". In France and the United Kingdom, deterrence or dissuasion provided the logic behind their nuclear postures. Though uneasy with endorsing the "Western" concept of deterrence, China's nuclear posture followed a comparable rationale.

This essay explores the place of nuclear weapons – and more specifically, the concept of nuclear deterrence – a little over one year after the attacks on the World Trade Center and the Pentagon by Al Qaeda. It does so by asking four questions about the "nuclear undertaking" in today's world. These are: What has changed since September 11? What has remained constant? What are the most critical uncertainties? And perhaps most important, Where is there a need for new thinking about nuclear weapons and deterrence?

What's New after September 11?

Most definitely for the United States and in varying degrees for other countries, the terrorist attacks on the World Trade Center and the Pentagon radically transformed the global security agenda. A newly-launched War on Terrorism has finally displaced

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the lingering residues of Cold War confrontation between Washington and Moscow. Once an afterthought among senior policymakers, the proliferation of nuclear, biological, and chemical (NBC) weaponry has now been acknowledged to be a major threat. Less so abroad than among American officials, there is a strong fear of attack, not seen since the worst days of the Cold War.

Terrorism, Vulnerability, and Homeland Security

For the United States, a continuing confrontation with Al Qaeda and its affiliated organizations is likely to dominate the security agenda for the foreseeable future. In part, this reflects the fact that the United States has emerged as the primary symbol of that modern, secular order rejected and resented by Islamic terrorists, their immediate supporters, and their wider milieu. In part, it reflects the likelihood that it will prove very difficult to break the back quickly of this terrorist threat – given the large pool of potential terrorist recruits (due to the breadth and depth of personal resentment and alienation), the availability of means (due partly to the diffusion of technology and partly to the vulnerability of modern societies to improvised but effective means of destruction or disruption), the constraints on response (due to the very nature of liberal democratic society), and the availability of state supporters (due to some combination of sympathy, fear, and compatible interests).

From the start, moreover, a strong sense of vulnerability in the senior-most levels of Washington decision-making has been part of this changed agenda. It was most evidenced in the months immediately after September 11 attacks by the decision not to permit the president and the vice-president both to be present in Washington at the same time. But it has persisted since. Increasingly, "Homeland Security" against terrorist attack has become the preeminent security concern. For that threat, traditional nuclear deterrent strategies offered little if any answer.

This emphasis on the centrality of the war against terrorism also has reinforced the already evident intention on the part of the Bush Administration to transform the U.S.-Russian political-military relations and to put in place a new non-adversarial nuclear relationship. The September 11 attacks and the events that followed provided an opportunity for President Putin to cast his lot with the United States.[1] Though robust nuclear legacy capabilities persist, nuclear issues were increasingly sidelined in the changed relationship between Moscow and Washington. (In many ways, the two presidents' signature of a two pages Treaty of Moscow served only to highlight this lessened salience of nuclear matters). In turn, the increasing emphasis on NATO's role in countering terrorism has provided a framework for Russian cooperation with NATO countries and made it far easier for Russia to accept that organization's expanded membership.

1 During the FRS seminar, this point was suggested by Alexander Pikayev.

Confronting the Proliferation Threat

A steady increase in the attention paid to the threat of NBC proliferation also has characterized the period since the September 11 terrorist attacks. This heightened emphasis on the proliferation threat in some measure results from parallel concerns about terrorist use of so-called weapons of mass destruction (WMD). Particularly after the attacks on the World Trade Center towers, it has become widely accepted that at least Al Qaeda would have no reservations about using WMD to serve its goals – were it able to gain access to such weapons. For Al Qaeda or another terrorist group, one possible route to WMD would be through either purchase or theft from disaffected elements within an already established WMD state. Still another would be for an aggressive regional power such as Iraq to provide such access on the grounds of a compatibility of interests between it and the terrorist group.[2]

The possession or pursuit of NBC weaponry by several regional countries provides still another reason for the heightened attention to the proliferation threat. This has been especially so in the case of the United States, with growing attention paid by Washington policymakers to the risks posed by the so-called "Axis of Evil" – North Korea, Iran, and Iraq. Partly because of concern about unilateral military action by the United States, moreover, a new international consensus has been forged in an attempt to use United Nations inspections to disarm Iraq's NBC programs. For Washington, the need for doing so rests partly on its fears of links between Saddam Hussein and Al Qaeda as well as the risk that Saddam would be prepared to catapult Al Qaeda into WMD.

Still another reason for this new attention to proliferation was the risk throughout late 2001-2002 of a nuclear conflict between India and Pakistan. That risk had jumped following last winter's terrorist attack on the Indian Parliament, an attack not inconceivably carried out by individuals indirectly linked to Al Qaeda. Even now, another terrorist incident could trigger yet another confrontation between India and Pakistan.

In confronting this latter threat of nuclear war between India and Pakistan, nuclear deterrence can lessen the dangers. Over time, Delhi and Islamabad may work out their own version of the type of stable deterrence that helped contain the Cold War confrontation. But the transition is likely to be prolonged and subject to shocks – most dangerously from a mixture of internal instabilities (including terrorism), domestic political posturing, and technical force posture limitations. For their parts, the existing NPT nuclear weapon states are greatly constrained by their NPT obligations in seeking to foster a stable transition.

2 This heightened concern about terrorist access to nuclear materials contributed to considerably greater post September 11 Bush Administration support of Cooperative Threat Reduction programs to enhance security over Russian nuclear weapons materials and warheads. In turn, the Administration's belief that Saddam Hussein was linked to Al Qaeda reinforced its belief that the war on terrorism and regime change in Iraq were linked.

By contrast, in confronting the threat of use of WMD by apocalyptic terrorist groups, nuclear deterrence appears virtually irrelevant. Given both the readiness of Al Qaeda's operatives to undertake suicide missions and the lack of any "territorial return address", the threat of nuclear reprisal lacks impact and credibility. (Other types of deterrence, as discussed later, warrant exploration, particularly aimed at less apocalyptic terrorist groups). Perhaps the threat of nuclear reprisal might be leveraged to influence state supporters of a terrorist nuclear attack – the scenario of Saddam Hussein's acquiring nuclear weapons and providing one to Al Qaeda. But it appears equally likely that a state sponsor like Saddam Hussein could believe that his support would go undetected or that absent irrefutable evidence of such a linkage, no state would be prepared to respond with a nuclear weapon. These considerations would be even more compelling in the event of terrorist use of chemical or biological weapons.

Perhaps most important, the role of deterrence in confronting hostile regional adversaries armed with WMD has been a subject of continuing debate, not least between the Bush Administration, its critics, and its European allies. Unlike the latter, the Administration is skeptical of both the desirability and the feasibility of reliance on deterrence to contain new WMD adversaries. Over the past year since September 11, this skepticism has become increasingly evident in the cross-Atlantic debate about how to deal with Iraq's pursuit of nuclear weapons. For the Administration, a nuclear deterrence relationship between the United States and Iraq is undesirable since it would mean that Saddam Hussein could deter the United States from protecting allies and interests in the Gulf. The feasibility of such a deterrence relationship is subject to question, as well, given the risks of miscalculation on Saddam's part. This logic has reinforced the Bush Administration's emphasis on missile defenses but even more importantly contributed to its enunciation of a new "preemption doctrine" – in effect, claiming a right to shut down WMD programs before they can become threats.

To the extent that the Bush Administration has emphasized deterrence in its defense thinking, moreover, its concept of deterrence reduces the role of nuclear weapons. Deterrence outside the Cold War context is seen to depend on a mixture of offenses (with as much if not greater emphasis on advanced conventional weaponry), defenses, and infrastructure (to include information operations.[3]

American Global Activism

A year after September 11, there also is a new wave of American global activism. From the initiation of the War on Terrorism to the commitment to the WMD disarmament of Iraq, this new activism is shaping global security. Taking at face value the new U.S. National Security Strategy, issued by the Bush Administration in October, 2002, this activism may extend to efforts to influence the domestic political, social, and economic institutions of other countries in a more open, democratic,

3 This is the clear thrust of the publicly-briefed information on the U.S. *Nuclear Posture Review*.

market-oriented direction. In part, this new activism reflects recognition that a long-term response to the threat posed by apocalyptic terrorism requires efforts to deal with the internal, domestic breeding grounds for new generations of terrorists. It also reflects that deep-seated American inclination, as the National Security Strategy states, "to help make the world not just safer but better". As the document also suggests, the present time is seen as a time of opportunity for reshaping relations among the great powers into cooperation for the good of all nations. For the matter directly at hand here – nuclear weaponry and nuclear deterrence in the aftermath of the September 11 terrorist attacks – this new activism entails a readiness to set aside old approaches in dealing with former adversaries and in using American power abroad. Already, as noted, this has been evidenced by both the changed concept of deterrence as well as the new preemption posture.

What's Constant after September 11?

Viewed from the vantage point of nuclear deterrence and nuclear weaponry, there also are important constants, important elements of the "old" that continue to define the global environment a year after the September 11 terrorist attacks. Large, ready residual nuclear forces in both the United States and Russia stand out – in part against an overall but not across-the-board trend toward lessened reliance on nuclear weapons on their part. With regard to the other NPT nuclear powers, both France and the United Kingdom have cut back their nuclear forces while by contrast China continues its decade-plus program of nuclear modernization. A year after September 11 – much as a year before – there continues to be a growing crisis of confidence in the overall set of non-proliferation treaties, institutions, and mechanisms.

Legacy Nuclear Force Postures

Over the past decade, there has been a continuing decline in the size of the nuclear forces deployed by both the United States and Russia. From upwards of 12,000 deployed strategic nuclear warheads on each side toward the end of the Cold War, numbers have dropped to the low thousands of deployed nuclear warheads on each side on longer-range ICBMs, SSBNs, and bombers. Those numbers will decline still further to between 1700-2200 for each country under the 2002 Treaty of Moscow. A significant part of these forces remains on high alert status, in the Russian case dependent on a warning system that has degraded markedly and is of questionable reliability.

Nonetheless, there are some important limits -- structural and doctrinal but also institutional and psychological – on this trend toward lessened overall reliance on nuclear weapons. The United States and Russia still retain very substantial deployed strategic nuclear forces in comparison to the changed political-military relationship between them – a relationship which at best is becoming increasingly cooperative and at the least which is no longer defined by military confrontation in the heart of Europe. Each side also retains significant numbers of non-deployed nuclear weapons in storage. For the United States, this will include a so-called "responsive force" of

many thousands of stored nuclear warheads removed (or to be removed) as part of the strategic forces reductions process and retained as a hedge against the future. For Russia, it also includes very large numbers of non-strategic or tactical nuclear weapons, publicly estimated between 7000-14,000 warheads.

With regard to doctrine and institutions, Russian defense analysts continue to explore possible reliance on a new generation of very low yield, flexible nuclear weapons to compensate for Russia's overall conventional weakness and as a means of escalation control. Within the U.S. defense planning and technical communities, there has been continued interest in the potential contributions of very low yield – or so-called tailored nuclear weapons – in defeating regional WMD adversaries. Presumably, while Presidents Bush and Putin set their sights on a non-adversarial relationship, the military institutions in both countries have continued their long-standing nuclear war planning – typified by the U.S. Single Integrated Operational Plan or SIOP – for nuclear war with the other. Institutional constraints have been particularly evident as well in the reluctance of American nuclear planners to contemplate any reductions in nuclear force levels that would have called into question maintenance of a "nuclear Triad". Most broadly, the underlying psychology of Cold War confrontation still persists in residual uneasiness and suspicion among defense and military planners in both countries. As such, it serves as a sheet anchor to more far-reaching structural, doctrinal, or institutional revamping of the Cold War nuclear legacies.

France and the UK, Down; China, Up

The commitment of the United Kingdom and France to maintain an independent if changed nuclear deterrent posture is another carry-over from pre-September 11. Both countries, however, have reduced the size of their nuclear forces from Cold War days, while scaling back those forces' alert levels and readiness. Absent the Soviet threat, the retention of independent nuclear deterrents is justified by a mix of hedging against future threats, of deterring the use of NBC weaponry by a regional adversary, and influencing the United States.

By contrast, China's leaders have been committed to the modernization of that country's nuclear force. Already, China may well have displaced the United Kingdom if not also France as the world's third largest nuclear power. This trend on China's part toward higher numbers and greater sophistication can be expected to continue. Institutional interests, strategic "catch-up", and uncertainties about the future U.S.-China security relationship all are perceived to provide ample justification.

Crisis of Non-Proliferation Confidence

For assessing the state of nuclear weapons after September 11, one of the most important constants may be the growing crisis of confidence in traditional non-proliferation treaties, institutions, and mechanisms – or what is often called the "regime". Most often expressed by Bush Administration officials, this lack of

confidence in the regime's ability to prevent more widespread NBC proliferation is more widely shared among other countries' leaders if not usually verbalized.

The crisis of confidence has important roots in the inability – or even reluctance – of the regime's supporters to confront those countries that have been cheating on their treaty obligations and to find means to bring them back into compliance. In that regard, as discussed in the following section, United Nations' actions to ensure Iraqi compliance is an important test case. Another reason for the crisis of confidence is the recognition that the technical obstacles to acquiring NBC weapons are becoming less difficult to cross due to the very process of global industrialization and trade. Possible loss of expertise and materials, if not weapons and agents, from the former Soviet Union adds to this concern. Across many regions, moreover, not only are there countries pursuing particularly biological and nuclear weapons but there are other "over the horizon" proliferators that could choose to do so in the years ahead. For the latter, the actions of neighbouring countries, persistent regional insecurities, loss of confidence in American security guarantees, and a fear that widespread proliferation had become inevitable would provide the motivation for changing course.

Some Critical Uncertainties after September 11

There are a number of critical uncertainties that could dramatically shape the future role of nuclear weapons, and more broadly, of all WMD. Four of the most important uncertainties are: how the "test case" of Iraqi WMD disarmament plays out; how or perhaps whether NBC weapons are used again, an uncertainty closely but not exclusively tied to the issue of Iraq's WMD disarmament; the extent to which the American homeland is subject to future terrorist attacks by Al Qaeda and associated radical Islamic terrorist groups; and how successful the United States and others are in rolling back North Korea's now openly declared possession of nuclear weapons, bringing it finally into compliance with its NPT obligations.

Iraq's NBC Disarmament

At one level in the Iraqi "test case", the issue is what will be the outcome of the process of international inspections in Iraq by the International Atomic Energy Agency and the United Nations Monitoring, Verification, and Inspection Commission (UNMOVIC)? There are at least several possible scenarios.

One possibility is that a combination of robust international inspections, Iraqi mistakes, and Saddam's fear of U.S.-driven military action to overthrow his regime will lead Saddam to divulge and divest the greatest proportion of his covert NBC capabilities. Though residues may remain, the inspections process could be credited with imposing a very significant set-back to Iraq's WMD ambitions, perhaps on the order of a decade bought. Alternatively, robust international inspections could come up against steadily growing Iraqi resistance, consistent with past practices and with the possibility that those inspections might actually be "getting close" to core program elements. Almost certainly, the ensuing confrontation would give way to U.S. military action against Saddam, quite probably but not necessarily with United

Nations backing. In either of these two scenarios, the credibility of the overall non-proliferation regime – and of the great powers to stand behind it – would be strengthened. By contrast, at least a third scenario also is possible, one in which Saddam succeeds in hiding the greatest proportion of his NBC activities from the international inspections. This outcome would result in intense debate about the effectiveness of inspections – and if American official statements are take at face value, eventual unilateral American military action against Iraq's WMD programs. In this case, even if American military action eventually succeeds in providing proof of Iraqi NBC programs – and in disarming Saddam – the non-proliferation crisis of confidence still could be worsened. This is so because the international inspections process – and international responses -- would yet again have been proved insufficient.

At a different level, there is yet another, significantly more important uncertainty inherent in how the Iraqi test case plays itself out. Put quite starkly, if military conflict ensues to WMD disarm Iraq, Saddam Hussein will have compelling incentives to use chemical or biological weapons (CBW). Given what some U.S. officials have stated, either publicly or on background, the Iraqi leader would have to assume that at the least regime change will be the U.S. goal – and at worst, the United States will seek to try him as a war criminal and not give him the option to retire quietly to some safe haven outside of Iraq. So viewed, use of CBW in any number of ways – from seeking to impact the flow of battle through attempting to bargain for escape to exacting revenge – become plausible. In turn, depending on the characteristics of any Iraqi use of CBW (and concerns about what further uses might follow), use of nuclear weapons by the United States -- or for that matter, by Israel – could become an option to be debated. This, too, is part of the uncertainty inherent in the Iraqi test case now underway.

Whether – or When – NBC Weapons are Used

Whether in a second Gulf War, an escalating clash between India and Pakistan, an incident of apocalyptic terrorism, or in some other manner, there is a significant risk that nuclear, biological, or chemical weapons will be used before too long. Particularly for nuclear weapons, the very use of a nuclear weapon for the first time in over five decades would be a major international shock. Intense elite and public debate about the necessity, impacts, implications, and legitimacy of nuclear weaponry would almost certainly occur. In advance, it is at most possible to speculate about the implications for nuclear weaponry and how those implications would be tied to the specifics of use. Consider a few vignettes.

As already suggested, Saddam could use biological weapons to disrupt American military actions against Iraq. Assuming that such use resulted in many tens of thousands if not greater civilian casualties among friendly Gulf Arab countries, the United States could come under intense pressures to "end the war now" – even if that required use of nuclear weapons. In this situation, nuclear deterrence would have failed to deter the use of biological weapons. Moreover, assuming nuclear use occurs, a very significant taboo would have been broken, though efforts in all probability

would be made to justify such use as an *in extremis* action to prevent still further loss of innocent lives. These two effects cut in opposite directions: the former questioning the role of nuclear weapons in deterring use of biological weapons, the latter reinforcing latent or dormant perceptions of nuclear weapon as useful – and usable. (Paradoxically, an Iraqi use of biological weapons that triggered a U.S. nuclear response could well make pursuit of biological weapons considerably less attractive to today's potential regional aggressors.)

Somewhat differently, Iraqi use of biological weapon in a second Gulf War could prove relatively ineffective. This might be so because of technical or operational lapses by the Iraqi military, effective U.S. and allied protective measures, or sheer luck. In this situation, the case for relying on nuclear deterrence to deter use of biological weapons again would likely be undermined. Not only would it be argued by skeptics that the nuclear shadow had failed to deter but that other, more effective measures to counter this bio threat were available.

A closely related vignette for next use of a nuclear weapon could entail Israeli use during a second Gulf War, possibly after an Iraqi first use of biological weapons delivered by missiles against Israeli population centers. In this instance, Israeli nuclear use would be a desperate attempt to limit damage from further Iraqi attacks. Once again the shock of such use would be dramatic. Also perceptions of the role of nuclear deterrence in dealing with the bio threat as well as of the utility of nuclear weapons would be impacted. Perhaps most important, any such Israeli use would very probably intensify pressures within Arab countries to acquire their own nuclear weapons.

An escalating conflict between India and Pakistan provides yet another potential if uncertain nuclear flashpoint. A number of possibilities are conceivable – entailing, for example, intentional nuclear first use by Pakistan in response to conventional military defeat, an accidental detonation triggering nuclear escalation by both countries, and though less likely, Indian nuclear first use in the mistaken belief that a Pakistani nuclear first strike was imminent. Targets could include military formations on the battlefield, nuclear infrastructure, military and nuclear bases, and cities. A highly successful Pakistan nuclear first use, e.g., one widely regarded as having ensured Pakistani survival, would likely add to proliferation pressures elsewhere. By contrast, an India-Pakistan city-busting nuclear exchange in which both countries were clear "losers" would probably send the signal to other aspiring proliferators that nuclear deterrence is not so easy to assure and that nuclear weapons are dangerous.

Use of a stolen nuclear weapon, an improvised nuclear device, or a radiological dispersion device (RDD) by a terrorist group also cannot be discounted. From one perspective, terrorist use might be thought likely to have little impact on national nuclear deterrence postures on the grounds that such use is *sui generis*. Or at most, it might reinforce the importance of ongoing efforts to enhance security over nuclear weapons and nuclear materials in the nuclear powers. Conversely, any use of a nuclear weapon could reopen the now dormant public debate about drastic

reductions if not elimination of nuclear weapons as the best means to ensure effective control over nuclear weapons and materials.

How Will Americans Respond to Heightened Vulnerability?

Since the September 11 terrorist attacks, Al Qaeda has carried out additional attacks but none within the United States. This could change at any time. Moreover, until the U.S.-led war on terrorism succeeds, as eventually it will, in eliminating Al Qaeda as an effective global organization, the nature and extent of its direct impact on the American homeland – and how the American public will react – is another uncertainty. Under certain conditions, the future logic of nuclear deterrence and the broader nuclear undertaking could be impacted.

In principle, given Al Qaeda's apocalyptic vision and avowed goals, there is every reason to believe that this organization will seek to do the maximum damage possible to the American economy, population, and political order. Official U.S. warnings refer to possible future terrorist spectaculars on the order of the September 11th attacks. Use of WMD has not precluded, including even stolen nuclear weaponry. Assume, therefore, that over the next decade or so the United States is subject to a continuing series of terrorist attacks, some resulting in mass casualties, others in substantial personal fears and societal disruption. In this event, the American public could follow the example of the British public at the height of attacks by the IRA – in effect, regard those attacks as an outrage and get on with daily life. Equally likely, the American public would react quite differently, becoming steadily more fearful and insecure. This would be consistent with a long-standing tradition of viewing incidents of domestic violence as an aberration and with little first-hand experience with destruction at home in over a century and one half. This escalating sense of fear and insecurity, moreover, would likely be exacerbated by a 24 hours media barrage which would magnify the violence in near-real time. In this regard, the lessons are not encouraging from the sniper attacks that killed less than a dozen persons in September-October, 2002 but greatly disrupted personal life in and around Washington, D.C. Those attacks probably did "terrorize" a good part of the population.

If the future brings repeated terrorist incidents in the United States, American homeland security would increasingly define the national defense agenda. Budgetary priorities also would be reassessed. In turn, all defense programs would be evaluated in terms of their direct and immediate contribution to protecting the American homeland against terrorist threats and terrorist supporting states. As a result, the transformation of conventional military power to provide global reach to strike terrorist organizations and their state supporters would be accelerated further. By contrast, today's considerable financial and operational investments in retaining large, operationally-ready legacy nuclear capabilities – plus back-ups in reserve – could well come to be viewed with new-found scepticism. The case would be made that defense dollars put into hedging against future Russian recidivism could better be spent on protecting the American population at home. The political-electoral

process now would add the need to address a "protection gap" to the once-famous "bomber gap", "missile gap", and "window of vulnerability" of Cold War years. At least for Russia, the logic of deterrence would recede even further into the background.

In such a domestic American climate of the high politicization of Homeland Security, the very large anticipated expenditures on homeland missile defenses – publicly estimated on the order of $50-60 billion – also would likely be subject to comparable scrutiny. Proponents would seek, of course, to sweep national missile defenses of the homeland under protective umbrella of Homeland Security writ large. Even so, one impact quite likely would be to reinforce other reasons for not seeking to use missile defenses to negate China's nuclear modernization. As a result, there would be less likelihood of intensified U.S.-Chinese strategic competition in the decades ahead. Deterrence would persist but in China's case like that of Russia, deterrence would be more likely to slip into the background of the U.S.-China relationship. In a climate of heightened domestic terrorism, close scrutiny of the cost-effectiveness of national missile defenses could go so far as undercut its political-budgetary support in the Congress. Those voices arguing instead to rely upon nuclear deterrence as the means to deal with those few proliferators armed with handfuls of missiles could well again gain the upper hand in what has long been a controversial U.S. internal debate about whether or not to deploy missile defenses.

Dealing with North Korean Nukes – Yet Again

The acknowledgement in October, 2002, by North Korean officials that North Korea still has a clandestine nuclear weapons program and indeed, possesses nuclear weapons brought a persistent problem back to center-stage. Its outcome is another key uncertainty.

From the early 1980s, U.S.-led initiatives have repeatedly "solved" this problem only to have it reappear a few years later. Once again some package of carrots and sticks – from a U.S.-South Korea-Japan non-aggression undertaking to intensified sanction with the support of China and Russia as well – will need to be cobbled together in yet another attempt to change Pyongyang's calculations. In line with the Bush posture, the threat of military preemption might be in the background. But its credibility would be undercut by the danger that preemption could trigger Pyongyang's retaliation against Seoul (located within artillery range of the North's forces across the demilitarized zone) or even all-out war.[4]

How this latest manifestation of the North Korean nuclear weapons program is resolved will have important implications for proliferation in Asia and beyond. Clean and convincing roll-back of North Korea's program and that country's return to

4 Other novel approaches to deal with the other dimension of the North Korean proliferation challenge, its exports of missiles to unstable regions, might even be explored, e.g., creation of a consortium of concern countries to fix an annual production rate for North Korean missiles and to purchase that annual production.

compliance with its NPT obligations would be an important non-proliferation success. Its' impact would be magnified were it to follow successful WMD disarmament of Iraq.

By contrast, to the extent that the outcome is murky let alone entails accepting North Korea's open possession of nuclear weapons for the foreseeable future, the global non-proliferation crisis of confidence would be worsened. In turn, South Korea has so far reacted quite calmly during these periodic confrontations with North Korea's nuclear ambitions. Seoul's approach may reflect confidence in the ROK-U.S. deterrent of conflict, its priority on improving South-North relations, or not inconceivably a belief that eventual Korean unification will bequeath a nuclear capability to a new regime led preeminently by the South. Weighing against these considerations, the South has on more than one occasion set out to acquire nuclear weapons on its own, only to be persuaded otherwise by the United States. In turn, failure to roll back Pyongyang's bomb would heighten already growing proliferation pressures in Japan. Those pressures stem in part from Japanese uneasiness about China's nuclear modernization and its longer-term intentions in Asia. They reflect, as well, the unwillingness of a good part of the Japanese political elite to accept Japan's "singularization" as a non-nuclear power. For these persons, Japan's non-nuclear status is a legitimate necessity only so long as there is some prospect of eventual global nuclear disarmament. Not only would acceptance of North Korea's continued possession of nuclear weapons directly counter this latter sentiment but it would bring to the surface deep historic animosity between Japan and the Koreas.

Assuming a failure to roll back North Korea's program, nuclear weapons could move swiftly to the forefront of Asia security relationships. The resulting dynamics of proliferation in turn could directly affect both Russia and the United States, while indirectly spilling over to shape the calculations about nuclear weapons of other countries in distant regions.

Some Areas for New Thinking – Looking Ahead

In reflecting on the role of nuclear weapons and nuclear deterrence a year after September 11, there is finally a need for new thinking on several fundamental questions confronting the United States and the other nuclear powers today. Of particular importance for global security in the 21st century, consider briefly the following: How to define and advance toward a non-adversarial U.S.-Russian nuclear relationship? Under what conditions and for what purpose should the use of nuclear weapons be contemplated? And though not only a nuclear issue, what additional actions over and above reliance on deterrence and defenses can be taken to prevent the first use of NBC weaponry?

Defining a Non-Adversarial U.S.-Russian Nuclear Relationship

As already suggested in the preceding discussion, the nuclear relationship between the United States and Russia is in a state of transition. Washington and Moscow are

seeking to move from robust deterrence toward their stated goal of a so-called non-adversarial nuclear relationship. Some steps have been taken. However, what a non-adversarial strategic relationship between these former adversaries would entail – and how to get there – has yet to be fully thought through. A successful transition will require addressing issues of both concept and practice.[5]

At the conceptual level, inherent in this idea of a non-adversarial nuclear relationship between Washington and Moscow is the proposition that the overall state of political relations between the two countries – plus the internal political-economic make-up of Russia – should shape U.S. nuclear doctrine, posture, and operational requirements. Highly robust deterrence was the right and necessary strategy for a world of Cold War military confrontation in the heart of Europe with a totalitarian Soviet Union – an aptly-labeled "evil empire". That world no longer exists; nor can it be recreated. Consequently, it should be possible to walk back from the doctrine and posture of robust deterrence, implicitly linking thresholds of nuclear change to thresholds of political-economic change in Russia and in Russia's relationships with the West. For its part, the Bush Administration recognizes and has begun to act on this principle. But it equally appears torn between recognition of the need to change – witness the emphasis on a non-adversarial nuclear relationship – and institutional and psychological reluctance to move to far, too fast – witness its reluctance to cut numbers of deployed warheads "too far", its reluctance to change the day-to-day strategic planning and alert process as well as its retention of the so-called responsive force in effect as a hedge against Russian recidivism.[6]

Notwithstanding a changing political dynamic between Washington and Moscow, transformation of the U.S. and Russian legacy nuclear postures could at some point be affected by their dealings with nuclear third parties. China clearly comes to mind. Their dealings with regional proliferators also could impact the operational characteristics and other related dimensions of future nuclear postures though not numbers. Even at very greatly reduced numbers of deployed nuclear warheads, the two nuclear superpowers would continue to dwarf future nuclear proliferators.

At the level of practice, the operational characteristics of a non-adversarial nuclear relationship between Washington and Moscow need to be identified, defined operationally, and assessed in terms of possible risks, potential benefits, and the conditions under which such steps might be taken. So far, attention has focused on

5 Washington and Beijing also face the challenge of mutually adapting to Chinese nuclear modernization and American deployment of missile defenses in such a manner as to avoid triggering expanding nuclear competition. Over time, they, too, could take as their goal *vis-à-vis* China, a non-adversarial strategic relationship, or at the least some form of more restrained deterrence.

6 For their parts, France and the United Kingdom also appear to have accepted implicitly the underlying conceptual proposition that politics and deterrence are linked. This is reflected, for instance, in the reductions of their nuclear forces as well as the changes in operational force readiness that occurred during the first decade after the end of the Cold War. But among both countries' officials, there is an uneasiness not to go too far, too fast, somewhat akin to that in Washington.

reductions in numbers of deployed nuclear warheads. But there are other operational steps, some well-known, others less so, that could be pursued in ratcheting back the legacy postures of robust deterrence. Among such steps to be considered would be:

- A reduction in the alert levels of each side's deployed nuclear forces, with the goal of removing the overwhelming majority of those forces from day-to-day alert;
- Development and operation of a joint early warning system;
- Exchanges of military liaison personnel to key military command centers and operational facilities;
- A decision by the two presidents no longer to travel with the so-called "nuclear football", the nuclear codes carried by an accompanying military officer and always available to permit a rapid nuclear response;
- A cessation of nuclear war planning and operational exercises against each other;
- Consolidated storage and mutual monitoring of non-deployed nuclear warheads, to include both the U.S. responsive force and the overwhelming majority of Russian tactical nuclear warheads;
- Cradle to grave transparency of each side's nuclear production infrastructure, from warhead production to eventual dismantlement; and additional;
- Reductions in the numbers of deployed nuclear warheads.

Analysis of these and other possible steps would take place primarily on a national basis in Washington and Moscow. However, as part of thinking through what a non-adversarial nuclear relationship would entail, joint analyses could be productively pursued. As such, each of these individual analyses – as well as the overall goal of moving beyond the Cold War legacy postures and the political conditions for particular actions – could provide a central focus of a future U.S.-Russian strategic dialogue. As the time became ripe, additional actions could then be taken – implemented in whatever manner was thought most appropriate at the time, whether unilaterally, by some type of political agreement, or more formally if deemed desirable.[7]

Use of Nuclear Weapons – When (or Whether), Why, and After Use, What?

Faced with NBC-armed regional adversaries, the likelihood that an American president will confront the question of U.S. use of nuclear weapons probably is higher now than at any time since the 1962 Cuban Missile Crisis. Moreover, though views exist within the U.S. defense and nuclear communities on nuclear use in a regional conflict with a WMD-armed adversary, there has been little sustained and systemic analysis on this question. To do so, it would be necessary to address explicitly the

7 Initially, or over time, it would be possible, as well, to bring the other NPT nuclear powers into this type of ongoing strategic dialogue. In part, their participation would open up different insights into nuclear practice. In part, their participation would be a useful means to demonstrate the commitment of all five NPT nuclear powers to meeting their NPT obligations.

conditions under which nuclear weapons might be used, or the "when or whether"; the purposes of such use, or the "what for"; and the global political implications of nuclear use, or the "after use, what" and its implications for any decision to use nuclear weapons. To help provide grist for further discussion and analysis, the following sketches some initial thoughts on each of these aspects, written from an American perspective.

Regarding the "when or whether," any U.S. use of nuclear weapons in a regional WMD conflict should only be undertaken, if at all, as a last resort, *in extremis*. This judgment is consistent with the core of traditional U.S. thinking about nuclear use. It also reflects the reality that over four decades of war gaming have repeatedly demonstrated the great reluctance of senior American officials to contemplate use of nuclear weapons. Though linked in the Cold War to the threat of Soviet nuclear reprisals, this reluctance has now been institutionally, politically, and personally internalized. Equally important, there are good reasons to argue that nuclear use in a regional contingency should be contemplated only *in extremis*. Regardless of the justification, breaking the fifty year de facto nuclear taboo can be expected to increase proliferation pressures in other countries, including some countries that would fear that additional uses of nuclear weapons had now become more likely globally and that their own security required national nuclear capabilities. The likely adverse global political and public consequences for the United States of using nuclear weapons for *a second time* would quite likely be great – measured in terms of isolation from friends and allies, hostile public demonstrations, wider international condemnation, and damage to the broader non-proliferation regime. Despite best efforts to the contrary, use of nuclear weapons could result in unexpectedly high civilian loss of life and fallout damage to other neighboring countries.

How then to define last resort or *in extremis*? Will such situations ever arise? There probably needs to be a strong initial presumption in favor of use of conventional weaponry as long as such use could achieve the needed military effect – whether, for instance, victory on the battlefield, destruction of adversary WMD assets, or breaking the adversary's will to continue. Beyond that presumption, several examples taken from the types of WMD conflicts that could lie ahead may be helpful.

For example, use of one or more nuclear weapons to destroy an adversary's deeply buried biological weapons storage sites preemptively, prior to the use of either chemical or biological agents by that adversary, probably fails the last resort or *in extremis* test. Deterrence still might work; protective measures could prove effective. Similarly, use of nuclear weapons to attack CBW storage sites in response to an adversary's use of chemical weapons on the battlefield may also fall short of last resort or *in extremis*. With effective protective measures, such battlefield use is likely to have a limited impact on troops as well as the overall battle. A preemptive use of nuclear weapons against an adversary's deeply buried biological weapons storage sites *but after that adversary had used low lethality biological agents* could begin to approach – but perhaps still not cross – the last resort or *in extremis* boundary. A readiness to use low lethality biological agents could be taken to indicate that

escalation to more devastating lethal biological agents would soon follow. By contrast, in the event of an adversary's initial use of lethal biological agents, resulting in many tens of thousands if not even higher civilian casualties, the last resort-*in extremis* threshold could well be breached. At that point, the question in this example would become whether only use of nuclear weapons – in a manner consistent with the international law tenet of proportionality – could prevent even greater civilian loss of life. Not least, as this last example suggests, situations of last resort-*in extremis* may arise in future regional WMD contingencies.

Assuming then that use of nuclear weapons would only be seriously contemplated in conditions of last resort or *in extremis*, "the what for" of nuclear use also needs to be addressed. Unlike the Cold War confrontation with Russia, there appears to be little interest within the U.S. defense and nuclear communities in using nuclear weapons as instruments to destroy an adversary's society – or to exact lesser levels of punishment – in retaliation for prior use of NBC weapons. (This likely reflects the availability of many other conventional options). Instead, to the extent that the purpose of nuclear use is discussed publicly, such use is most often viewed as a means to destroy targets that cannot otherwise be destroyed with U.S. conventional weaponry. In this regard, the difficulties of destroying hard, deeply buried targets in regional adversaries figure prominently. There is, that is, what may be termed a "targeting approach" to nuclear use. By contrast, a quite different approach would emphasize that given the gravity of use of nuclear weapons, any such use must achieve a strategic end. Put otherwise, if nuclear weapons are used *in extremis*, such use should hold out the prospect of terminating a WMD conflict on terms acceptable to the United States and its coalition partners as well as of preventing further innocent loss of civilian life from adversary WMD use.

In weighing the possible use of nuclear weapons in a conflict with a regional WMD adversary, "after use, what" also demands attention. This question did not truly arise in the case of the Cold War confrontation between Moscow and Washington. A breakdown of deterrence and escalation to an all-out nuclear exchange between the two nuclear superpowers would have destroyed both societies, their allies, and if the more pessimistic scenarios of "nuclear winter" are to be believed, the rest of the globe. Other than in a narrowly operational and military sense, there was no "after use, what" to worry about. By contrast, as already suggested, use of a nuclear weapon by the United States would be the greatest international shock since the last use of nuclear weapons at Hiroshima and Nagasaki. Even if widely accepted as justified *in extremis*, such use will have unpredictable consequences for future global security. From this perspective, thinking about "after use, what" reinforces the already-existing presumption of great caution in contemplating any U.S. nuclear use in a regional WMD conflict. At the same time, it points toward the importance of seeking to think through the possible ramifications of nuclear use and of ways to mitigate them.

As a brief aside, this issue of "after use, what" arises, moreover, regardless of who uses nuclear weapons – or for that matter, any other weapons of mass destruction. In that regard, it is important to think about the possible repercussions of use of NBC weapons by a regional adversary (or a terrorist group) and about how to mitigate those repercussions. How the United States and its allies and friends respond to such use will be an important part of that process in determining what lessons other countries (or terrorist organizations) learn from such initial adversary use. Consider only the fact that failure of the Western world to react strongly to Iraq's use of chemical weapons in its war with Iran in the 1980s had the effect of stimulating other countries to launch their own CW programs.

An Enforceable International Consensus against Use

National self-help, often entailing significant political, technical, and military cooperation among nations, remains the principal response to the threat of NBC use by either national adversaries or terrorist groups. This will not change. However, in the very different geopolitical environment after first, the end of the Cold War and second, the terrorist attacks of September 11, the time is becoming ripe to consider additional international cooperative action to strengthen constraints on use. Two possible initiatives warrant closer scrutiny as complements to national self-help: the first, a more limited initiative to create an enforceable international consensus against the use of biological weapons (or assistance in such use); the second, a more far-reaching initiative to create an enforceable international consensus against the first use of any so-called weapon of mass destruction (and again, assistance in such use).

Regarding creation of an international consensus against biological weapons use, there are different ways to proceed. The United States could take the lead in seeking agreement among as many of the great powers as possible to make national declarations that henceforth they would regard any use of biological weapons by a state or a terrorist group as an international crime against humanity. As a corollary, they could equally declare that those states providing assistance in any such use also would be held accountable. Expressions of support might be sought from friends and allies in multilateral and regional forums. Then, the great powers could move to reflect this emerging international consensus against biological weapons use or assistance in a resolution of the United Nations Security Council. Or a Security Council resolution could be the initial mechanism for generating and then reflecting this international consensus.

This type of strong international warning against use of biological weapons would reinforce and legitimize other national deterrent actions aimed at aggressive regional adversaries. In some instances, by undercutting the perceived benefits and heightening the perceived risks of use of biological weapons, it also could tip the balance against national decisions to acquire biological weapons in the first place. Like its national counterpart, the direct impact of this type of deterrent threat on an apocalyptic terrorist group such as Al Qaeda would be marginal. But there are many other terrorist groups that even now may be debating whether a shift from explosives

and guns terrorism to biological terrorism would serve their more limited political or territorial objectives. For these terrorist groups, a strong international signal could have an important reinforcing impact. Indeed, to the extent that this consensus entailed agreement that all hands would be against a terrorist group that used biological weapons its impact could be greater than national deterrent actions alone. For both nations and terrorist groups, the no-assistance component would strengthen more traditional efforts to make it technically harder to develop biological weapons agents and effective means for their dissemination. It also would buttress international cooperation of other sorts, not least aimed at disrupting and preempting those terrorist groups that were thought to be interested in biological weapons. No assistance would also strengthen deterrence against any state providing support to a terrorist group in its pursuit of NBC weaponry.

The second initiative would go a considerable step further to seek an enforceable international consensus against the first use of any NBC weapons – and any assistance thereto. Both states and terrorist groups would be covered. It, too, could be reflected best in a resolution of the United Nations Security Council. As for such a resolution's payoffs to national efforts to prevent NBC use, they would be comparable in nature to those of the less inclusive initiative dealing with biological weapons only – enhanced overall deterrence, strengthened cooperation in prevention, and more technical obstacles put in the way of nations and terrorist groups. For the five NPT nuclear powers, excepting China, these potential benefits would need to be weighed against the perceived costs of giving up their right to use nuclear weapons first. In that regard, moreover, it is difficult to envisage a credible future scenario in which the United States (or for that matter the other NPT nuclear powers) would use nuclear weapons absent a prior use of NBC weapons. Even so, there is likely to be considerably greater reluctance on their parts to contemplate pursuit of an enforceable consensus against NBC first use than to support the more limited consensus against biological weapons use.

For both initiatives, many questions arise. If deterrence failed, how would the consensus against use be enforced? By whom? Subject to what, if any, international oversight? How would proscribed assistance be defined? Again by whom and with what penalties? How would the two initiatives be related? Should creation of a consensus against biological weapons use be regarded to be a stepping-stone to a later consensus against NBC first use? Aside from the NPT nuclear powers, how would other countries respond? Will there be an irresistible temptation on the part of non-nuclear countries to seek to expand the more limited biological weapons initiative to cover all WMD, thereby dooming it? Would agreement to a more encompassing consensus against NBC first use make it more difficult for the United States and other NPT nuclear powers to argue against precipitous steps toward nuclear abolition – or contrariwise, by proscribing the role of nuclear weapons would this action strengthen the case against such steps?

Notwithstanding the potential payoffs for national self-help, the prospects today probably are slim for successfully pursuing either the more limited or the more all-encompassing enforceable consensus against use. But it is not premature to begin thinking seriously about whether and how this type of international action could complement national self-help. This is especially so because after the shock of an all-but-inevitable future use of WMD, there almost certainly will be an international call for new approaches.

Conclusion

For most of the last half of the 20th century, nuclear weapons – and the concept of nuclear deterrence – were at the center of global security. But even before the terrorist attacks of September 11, nuclear weapons had begun slowly if unevenly to recede toward the background of the U.S.-Russian relationship – and for that matter between Russia and its other two nuclear-armed Cold War antagonists, France and the United Kingdom. By contrast, the proliferation of NBC weaponry to the regional peripheries stood out in the world before September 11, creating a wider crisis of non-proliferation confidence. NBC use in regional conflicts increasingly appeared the dominant challenge to regional security and stability – both for the countries in the regions and for outsiders such as the United States. Indeed, with open nuclear weapons deployments under way since their 1998 nuclear tests, India and Pakistan already were engaged in an uneasy and unstable nuclear confrontation.

In the aftermath of September 11, an internationally activist United States has taken the lead in organizing a global war on terrorism. Russia has thrown in its lot with the West in this global war, opening up in turn, new possibilities to step back further from the legacy Cold War nuclear postures and attitudes that remain prominent in both countries. Now is the time to initiate an intensified dialogue between Washington and Moscow on practical actions to pursue their common goal of a non-adversarial nuclear relationship. Such a dialogue should come to include the other NPT nuclear powers; not least since China's ultimate nuclear choices – which remain uncertain – could ultimately provide a check on the declining role of nuclear weapons and nuclear deterrence between the former Cold War adversaries.

By contrast, across the globe's regions, a year after September 11, the dangers of NBC proliferation and use continue to loom large. Added to the traditional concerns is the new fear of use of WMD by Al Qaeda or a successor organization. At the same time, two critical but uncertain non-proliferation tests loom ahead: the WMD disarmament of Iraq and the nuclear roll back of North Korea. Depending on the outcomes, the role of nuclear weapons – from perceptions of the usability of such weaponry to calculations of the security risks of not seeking to acquire nuclear weapons – could be dramatically altered.

Finally, a year after September 11th, there is an even greater need to think hard about the issues of use. At one level, this entails thinking through the global security impacts of any use of nuclear, or for that matter biological or chemical weapons –

whether by a state or a terrorist group. At another level, there is a need for U.S. decision-makers to think through the conditions of U.S. nuclear use in a clash with an NBC-armed regional aggressor – from when such use might be justified to the key question of "after use, what? Not least, new thinking is needed about how to create an enforceable international consensus against use – possibly initially against biological weapons but ultimately against the first use of nuclear, biological, or chemical weapons. On balance, such an all-encompassing consensus offers many payoffs to complement national self-help both in preventing more widespread proliferation, punctuated by periodic use of NBC weapons, and in containing the risk of terrorist use of these weapons.

SEPTEMBER 11 AND THE NEED FOR INTERNATIONAL NUCLEAR AGREEMENTS

Michael May[*]

The "War on Terrorism?"

What is the impact of the events of September 11 and the subsequent "war on terrorism" on nuclear issues? The "war on terrorism" is a handy political moniker for what the United States must learn to do in response to changes that have actually been taking place over several years. Some of the US responses to date have been wise. Some need a new look. Perhaps most important, in some areas, the United States and other countries have not responded and may be at a loss to respond, given the constraints on their policies. Some of these lacking responses provide the most important items on the post September 11 security agenda. In what follows, I will give one view of what these are and what to do about them.

I begin with nuclear terrorism, particularly the possibility of using nuclear weapons for terrorist purposes. The next section addresses the related issue of nuclear proliferation to state and non-state actors. The events of September 11 have given a new twist to that issue. There is a relationship between the possibility of nuclear weapons getting into terrorists' hands and the problems in Iraq, South and Central Asia, and North Korea. The following sections deals with an item that is no longer high on the US political agenda but which is tied to proliferation and terrorism and has a greater long-range potential for causing trouble, the incipient nuclear rivalries around the world. In closing, I suggest some elements of a desirable nuclear posture to deal with some of the problems outlined.

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Nuclear Terrorism

That terrorists could avail themselves of the tools our globalized world puts at the disposal of those with money and connections has been a concern in the governments of developed countries for some time now. That these tools might include weapons of mass destruction has been an explicit focus of that concern. In the United States, William Perry and Ashton Carter, respectively Secretary and Assistant Secretary of Defense in the previous administration devoted much effort to preventing what they call grand terrorism[1], using weapons of mass destruction.

There are several kinds of nuclear terrorism with different relative risk and prevention and protection measures. In increasing order of damage potential and probably decreasing order of likelihood, the main tools of nuclear terrorism considered are radioactivity dispersal devices, involving the explosive dispersal of radioactive substances in common medical and industrial uses, other means of unlawfully exposing the public to radiation, attacks on nuclear reactors or spent fuel sites, and finally nuclear explosions. All of these have been the subject of tighter controls and more widespread detection efforts, but there is a good deal that can be done yet that would be feasible technically and economically, though often difficult politically.

Considered most likely but least damaging are radioactive dispersal devices (RDD's or dirty bombs). These are ordinary explosives laced with radioactive material. Most of the casualties would be due to blast and fire. The radioactivity would be mainly deposited within the building that is destroyed. The buildings and ground where the explosion occurred would have to be decontaminated, and, if there is fallout, so would a larger downwind area. All of this has been done before, in connection with radiation accidents, but it would take time and money. Public panic is sometimes predicted, but experience shows the public does not panic easily, especially if information and leadership are available. Media discussion of this possibility at least in the United States has improved considerably.[2]

It would not be the easiest thing in the world for a terrorist to get hold of enough nuclear material for a dirty bomb or to put it in a suitable form for delivery. True, there are thousands of radioactive sources for medical, home and industrial uses all around the world. But most of the medical sources are low-level, or decay rapidly, or, as is the case for large cobalt sources, are encased in machinery that is very difficult to move. The high-intensity sources used to inspect welds in ships and pipelines are

1 Ashton B. Carter and William J. Perry, *Preventive Defense. A New Security Strategy for America* (Brookings Institution Press, Washington, D.C. 1999), Chapter 5.

2 The author and others at CISAC Stanford have recently sponsored workshops involving media and local first responders, and issued publications on this subject. In the course of this work, it became clear that much more information was needed by media and public, but also that a growing number of media articles were factually accurate and rational in tone.

solidly encased in shielding material, and can be very dangerous to anyone handling them the wrong way.

Still, better control measures are needed. Some of these dangerous sources have been "orphaned", that is, lost to the accounting system, where one exists. They could be used by terrorists, though with considerable and fairly dangerous adjustments. And even in Western countries, where all radioactive sources strong enough to do damage are inventoried and under some degree of control, theft, especially by insiders, is still possible.

Nuclear power plants are already tough targets by usual norms, but usual norms are not applied to them, and security measures are not uniformly strong. The plants and their spent fuel sites vary in hardness. Quick fixes such as air defenses, which are expensive and of marginal utility, have been put into place and should be replaced with more consistent and sustainable measures. In the United States, there is a tug of war among the NRC, the industry, and their critics in Congress. Some of it is inevitable but some of it points to continuing problems.[3] Nuclear power is not likely to be abandoned short of a successful attack and I don't believe a successful attack on these facilities is likely, but some fixes are needed. In addition, research reactors have not been held to the same standards of security as nuclear power plants. They contain far less radioactivity, but they are often located in cities and an attack on one of them, while not disastrous in terms of lives, would generate renewed opposition to all nuclear sites. Some, in addition, have not been reached by the US RERTR program that aims at recovering and replacing all HEU, and thereby pose a danger of theft of a nuclear weapon material.[4]

It should be noted that many conventional power plants need to be better secured. Many are located in or near cities, several cluster sites exist that group together coal-burning plants and major electrical transmission equipment, and they are not secured to anywhere near the standard met by nuclear plants even though a successful attack on them could cause major casualties and financial loss. They are not however our topic today, except insofar as a thorough look at all major targets for terrorist attacks should be taken and may make nuclear power look comparatively better than it does now.

Possible nuclear weapon terrorism, putatively the least likely and certainly the most damaging kind of nuclear terrorism, has been addressed mainly through the Nunn-

3 For critics' view see *Upgrading Physical Protection at Nuclear Facilities to Address New Threats* by Edwin S. Lyman, Nuclear Control Institute, MIT Security Studies Seminar, April 18, 2002.

4 See: *Could Terrorists or Thieves Get Weapons Usable Material from Research Reactors and Facilities?* George Bunn, Fritz Steinhausler and Lyudmila Ziatseva, Center for International Security and Cooperation, Institute for International Studies, Stanford University, Encina Hall, Stanford, CA 94305 and *Progress of the Rertr Program in 2001*, Armando Travelli, Technology Development Division, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, Illinois 60439-4841 – USA.

Lugar and other programs for securing and where possible destroying[5] the materials to make nuclear explosives, programs that also date back to previous administrations. Securing the materials essential to build nuclear weapons is the best handle on minimizing the chances of the worst kind of nuclear terrorism. It still does not receive appropriate funding or priority in the United States and it receives even less elsewhere. Recently a meeting of the G-7/8 decided to put $10 B over 10 years into these programs, but at the present time the money is far from being made available.

Beyond this, for both radioactive materials and nuclear weapons fissile materials, transportation is a key area for control. Every major country "depends on an infrastructure that spans the globe".[6] Commercial tools exist today to track and control international container traffic by ship, air, and truck, and pilot programs are underway at a few major world ports to test these tools and help design an overall system. The cost would be a small tax, less than one tenth of one percent on the six trillion dollars or so worth of world container traffic, without taking into account the benefits to be derived from better accounting and protection of goods shipped, benefits that are estimated to be so significant that private shippers and some ports have begun to put some of the steps into practice. The system must be affordable and practicable in a variety of different countries. It must be designed so it does not degrade catastrophically, tested under actual conditions, and then monitored during operation and changed as needed, particularly as it may involve multiple access to large databases. There are pitfalls and risks of introducing new vulnerabilities in this process. International agreements, both in the private and the government sectors, as well as changes in business and labor practices are required. Reaching agreement on these is likely to be the most difficult and time-consuming part of the task.

Nuclear Proliferation

The foregoing leaves out of account the motivations for grand terrorism and in particular nuclear terrorism. Again one must make a distinction between terrorism involving the dispersal in some way of radioactive material and terrorism involving detonation of a nuclear weapon. The former can probably be done by small organized groups, but the level of damage is limited, though the political impact if preparations are judged inadequate could be severe. As to the latter, one cannot say categorically that nuclear weapon terrorism is impossible without the support of a government, but it is surely far more difficult and unlikely without such support. Dissuading governments from acquiring nuclear weapons, materials, or technologies through supply constraints is increasingly difficult. One need only look at the successes of North Korea, South Africa, and Pakistan, and the near-success of Iraq despite close watching and strong discouragement, to see evidence of this trend. Supply constraints remain important, both as discouraging "bumps on the road" and as sources of

5 Through dilution in the case of HEU, via burning in commercial reactors or burying in a permanent waste disposal site in the case of plutonium.

6 Stephen E. Flynn, "America the Vulnerable", *Foreign Affairs,* (January/February 2002), Volume 81, Number 1, pp. 60-75.

intelligence information, but, given that thirty to forty countries could acquire nuclear weapons without much effort, preventing nuclear proliferation is mainly a question of affecting the demand side, i.e., motivation.

Unfortunately, while signals are mixed as usual, and the non-proliferation regime still holds in the main, it would be difficult to argue that incentives for acquiring nuclear weapons or improving nuclear forces have diminished in the past few years. In the growing, troubled regions of the world, which center on Asia, there is both more uncertainty and more capability. Threats have become more regional and harder to meet. In East Asia, the United States still guarantees South Korean and Japanese security against Russia and China, but neither now threatens these countries. Rather, the problem centers about the future relative strengths of the regional actors and how much hedging will be required. The US administration is no longer putting its weight behind the Perry two-track policy in Korea, a policy that offered some hope of resolving that particular nuclear issue, and the US government currently may in fact be out of time and attention. For that matter, none of the local governments involved has much time or political space to offer leadership toward any kind of cooperative security.

In South Asia, the actors are living from day to day and no outside power could guarantee security even if one were willing. It is unlikely that solving either Kashmir or Afghanistan problems, if that were possible, would resolve the contradiction of divided and marginally capable governments holding weapons of mass destruction. In West Asia or the Middle East, the US dual containment policy against Iraq and Iran, with its necessary base of support in Saudi Arabia, has been eroded by both domestic and international development, and nothing is coming along to take its place. Perhaps nothing can right now, the time is not ripe. This does not relieve the governments of the countries involved however from the need to hedge against a future that promises little hope of lasting security or meaningful security guarantees.

It is likely that acquiring nuclear weapons would do nothing to alleviate these insecurities and may make them worse, but neither the United States nor other countries is providing either the words or the deeds that might make a convincing case to the actors involved. A believable framework for extending the nuclear non-proliferation regime so as to make it effective despite regional insecurities is lacking and no one is clearly working on it.

The detailed measures against nuclear terrorism noted in the previous section are needed but they will amount to sticking fingers in the dike if meanwhile the number of countries where nuclear weapon materials are available and where terrorist organizations are not well controlled increases. Holding governments responsible for the activities of terrorists in their countries, which in fact means also holding the people of the countries at risk, will not suffice where the governments' sway does not reach or the governments are divided. Nor will the United States, alone or in coalitions of the willing, be able to police all the unsettled, nuclear-capable regions of the world.

Recent events have brought to light more clearly than before the existence of a network of indigenous suppliers and refiners of missile and nuclear technologies. In the most recent instance, cooperation among North Korea, Pakistan, Iran, and probably individuals and firms in Russia, if not the Russian government, is leading to improved potential for nuclear-tipped missiles in those countries. These same recent events also demonstrate a lively awareness of the constraints on US power on the part of the countries which the US government has announced it would sooner or later target for regime change. At present, the US is unnecessarily isolated in dealing with these problems. The electorates in its traditional democratic allies are averse to foreign wars, particularly without UN sanction. Russia seems to be the US new-found partner, but Russia has strategic objectives that will in several cases conflict with those of the US, if not now, in the longer term.

Something better is needed. The "something better" will have to be founded on the one generally accepted basis for international agreement in this area, the NPT and its associated regime. Unfortunately, at present, the United States, with its refusal to ratify the CTBT, moving backward from the START 3 agreement, and re-emphasizing tactical nuclear weapons could be considered in violation of its obligations under the NPT. At the same time, the United States has been the most muscular proponent of the NPT where it judged it in its interests. If that part of the international community interested in and capable of taming the nuclear danger is to move forward, some way must be found to square that circle.

Ironically, while this US administration has spurned the UN, it may wind up strengthening it. The muscular US stance toward Iraq, so far short of war, has caused the UNSC to do what it should have done in 1998, namely enforce its own resolutions. At this writing, IAEA inspections have resumed and are effective. The revitalized UNSC backed by US and UK force may yet force Iraqi compliance with its resolutions. All this may vanish if there is war, but if not, it could begin to establish a more effective pattern of enforcement of the NPT.

Nuclear Rivalries

Rivalries among nuclear or nuclear-capable powers seemed to wane when the Cold War ended but have now resumed in a more complicated way than before. The US-Russian/Soviet rivalry, heretofore more about influence than territory, is currently dormant, but NATO expansion, especially if it goes further, and US military arrangements with former Soviet republics ensure that if it resumes it will have a territorial and alliance component it has not had since the sixties. The US-China rivalry currently exists more in prospect and in the minds of certain elites in both countries than in actuality: China has so far refused to step up to any nuclear arms race, perhaps seeing that such a race would be a poor tool of influence now and a waste of money. In addition, the large and expanding business cooperation between the United States and China, both direct and indirect, introduce a cooperative element in the relationship that was never present in the US-Soviet rivalry. But, as discussed

above, other nuclear rivalries have emerged or are in prospect, South Asia and the Middle East being the two main locales.

The United States has been ambivalent with respect to nuclear rivalries and the threat they may pose, attempting on the one hand to dampen the South Asian rivalry and to prevent the emergence of nuclear rivalries in the Middle East, while on the other hand, in the latest nuclear posture statement, apparently bringing tactical nuclear weapons back into the forefront of regional war planning and deterrence, a step not calculated to reassure possible opponents that they have little to gain from going nuclear. It should be noted, while cataloging US sins, that, if the United States has been ambivalent, the European Union has been largely passive in these matters, sometimes following US leads, sometimes, as with the United Kingdom in South Asia and Iran, actively taking the lead, but more often than not limiting itself to vague general support with little added in the way of either power of the purse or military power.

In this section, I focus on what is sometimes considered the three-cornered strategic competition among the United States, Russia, and China. The present administration is tilting toward Russia, both out of current political needs and because Russia currently seems weaker than it potentially is, at least in my view. The administration considers itself in a situation of strategic rivalry with China, based mainly on ideological positions for domestic political consumption, backed by what seem to me to be shaky geopolitical assessments. I believe strategic rivalry between the United States and China exists but will fall short of posing serious military threats, unless the United States exacerbates it, for two reasons. One is the orientation of Chinese security interests to the continent of Asia and to the West, while the orientation of US security interests, though worldwide, must concentrate on control of intercontinental sea, air, and space lanes. I don't think the recent US arrangements in Central Asia will change these priorities for long. At present, there is no land boundary between China and the United States corresponding in salience or real importance to the Cold War boundaries in Europe and Korea. Nor has China been run by anyone like Stalin in respect to foreign policy.

The second reason is that this rivalry is not like the former US-Soviet rivalry in another respect, that of economic and ideological containment. The nature of Chinese growth and expansion backed since 1980 by Chinese government policy has moved China away from economic and ideological isolation from the rest of the world. China is an expansive trading state, with commercial and personal ties the world over, and a central commitment to maintaining these ties if it is, not just to prosper, but to maintain its political integrity. Economic containment of the Soviet Union was successful because the Soviet Union cooperated. Stalin and his successors, to maintain their rule, laid down an autarchic economic posture that discouraged commerce and travel to the West as much or more than the West discouraged it. China has gone the other way, with the consequence that it is now Communist in name only. Containment of China is feasible militarily along the land-water boundary that now roughly exists (with the exception of Taiwan), but economic containment of China by

the United States is not possible, nor will it be supported in the United States unless a major provocation is somehow engineered. Rather, President Clinton had it right: whether they like it or not, and they don't very much, the United States and China are bound to be strategic partners in most of the endeavors necessary for peace and prosperity, from trade to the environment.

Nevertheless, at present, owing in part to the needs of military bureaucracies, in part to mutual mistrust based on ideology and history, US-China rivalry exists. September 11 has muted the administration's anti-China rhetoric but has not given China a breathing spell. The United States has accelerated an already ongoing program of military commitments to central Asian dictatorships, thereby broadening to that region an approach that is proving increasingly fragile in the Near East and weakening China's "Shanghai Group" approach to creating a common economic and security interest group in Central Asia with itself as the central figure. China's view of that enlargement is predictably defensive, and Russia's, if one goes beyond Mr. Putin' current diplomacy to the rest of Russia's security establishment, is also quite reserved. Both may hope the US involvement is temporary or ultimately unsuccessful, but both may fear otherwise. Even with the Taliban gone, oil and gas pipelines will still run there. Meanwhile, US decisions to shift nuclear targeting and future force requirements to deal with a prospective war in Asia and to deploy a national BMD system have been if anything reinforced since September 11.

These decisions may lead the Chinese government to move nuclear modernization to a higher level of priority than heretofore, and to increase the planned force level. An aspect of this possible development that has not been emphasized concerns the form that modernization, in particular a survivable second-strike nuclear weapon force, may take in China, and eventually in any other country that feels itself threatened by the United States.

The United States has considered that quiet submarines are the most practical and effective way to obtain force survivability, with alert aircraft and mobile or moveable land-based missiles as very distant competitors. Fixed land-based missiles have been considered vulnerable to accurate systems and useful only as complements to other legs of the Triad and in a launch-on-warning mode. The Soviet Union competed with the United States more or less across the board. Russia has found it too expensive to do so, and has an increasingly vulnerable, first strike force, survivable only with launch-on- (imperfect) warning.

China and any other country facing the dilemma of survivability against a possible US attack have, I believe, even fewer options. Submarines and aircraft must look to them like chancy, expensive gambles against US naval, air, and space assets that are likely to be superior for the foreseeable future. Quiet small diesel submarines may offer some possibility of survival if they can get out of port unobserved, a threat to which the US Navy has made it clear it is devoting considerable attention. Land-mobile systems offer a possibility, but the Chinese road and bridge system, while

developing fast, is still and will for some decades remain thin, with much of it not up to the task of reliably supporting the size of truck required for an erector-launcher of suitable size. Moving missiles among a larger set of launchers hidden in warehouses makes sense theoretically, but runs into some of the same practical limitations and is subject to intelligence failures. The United States rejected those approaches as too complex, fragile, and politically difficult thirty years ago. Political difficulties are different in China but they would make such a deployment difficult or impossible in a number of provinces, and the technical complexity and fragility would remain.

Faced with these arguments, it is perhaps likely that a fraction of any Chinese missile force would be based in what must be considered by the Chinese and other governments as the relatively well understood and inexpensive option of fixed basing or mobile missiles that spend most of their time in garages. Those would be vulnerable to a US strike, nuclear or perhaps conventional. That vulnerability in turn may lead the Chinese to rely for deterrence on some form of launch on warning option, another relatively well understood (technically) and inexpensive option.[7] Such an option could fit in with space development plans. It would not have to be very good to be a net detriment to US security.

Elements of a Suggested Nuclear Posture

Throughout the foregoing discussion, one strand may be noticed: today's nuclear dangers are even less amenable to unilateral cure or to cure by temporary coalitions than was the case when the institutions to deal with those dangers were first put in place thirty years ago. Nuclear arms races, nuclear proliferation especially to regimes with a history of aggression, and nuclear terrorism cannot be tackled without the aid of viable, practicable, politically sustainable international institutions. We have a start on those, although some steps backward have been taken recently. In any case, the situation has changed in several relevant ways in the past thirty years, and changes are needed. In what follows, I suggest some directions for such changes. First, however, it may be useful to recapitulate briefly some of the more relevant changes.

First, the United States has coupled an assertive and expansive military and foreign policy with a backing away from international instruments of nuclear weapons control. Its erstwhile Russian adversary found it necessary to accept the loss, not only of the buffer states it has traditionally wanted, but also of the non-Russian part of the Soviet Union and of much of the old Russian empire before that. China, as noted, is explicitly identified by the US government as a future threat to US central interests despite a generally non-aggressive posture. The United States has established new military presence in Central Europe, the Middle East, and Central Asia and continues to give its highest military priority to offensive forces. Thus, the lines of demarcation between regions of central national interest, once clear and agreed, have become

7 The PRC has neither early-warning satellites nor early-warning radars, at least for detecting ballistic missiles. It is a major gap and one could imagine how during a crisis or even a terrorist attack which involved a large explosion, there might be a temptation to strike back at a presumed, rater than confirmed, aggressor.

fuzzy and contentious at the same time as nuclear arms control measures have been weakened.

Second, as noted, nuclear rivalries and insecurities have become regional, as states with unresolved territorial claims, in conflict with each other, have either obtained or could soon obtain, nuclear weapons. Some of those states are internally unstable as well as externally threatened. In most cases, they are not separated from their adversaries by vast distances, but rather have common borders with them. Unlike the contestants of the Cold War, in some of these cases, the territories being contested are seen as vital by both sides.

Three, there is a possibility, so far as we know as yet unrealized, that sub-national groups may get one or more nuclear weapons, possibly out of the decay of the very large Soviet nuclear establishment, possibly with the complicity of states supporting terrorism, possibly from elsewhere.

To help meet these dangers, the present and largely accepted international arms control institutions should be brought up to date and broadened in at least the following three respects.

- *Strategic arms control measures between the United States and Russia should be extended in three directions: to include tactical and reserve weapons, to include precautions for securing weapons and materials, and to include cooperative provisions for shared tactical warning.* Further, the measures should be so crafted and presented that they lay the base for broader international treaties, accession to which, with suitable adaptations, should be open to all nuclear powers, *de jure* and *de facto*. Finally, the verification provisions that were a hard-earned feature of the SALT and START treaties, but which are absent from the SORT treaty, should be re-instated.[8] If more states come under this legal international framework, those verification measures will be even more badly needed.

- *The NWS[9] should strengthen both carrots and sticks under the NPT and its associated regime. Together with the EU and Japan, they should put more money into the IAEA and other organizations for accounting and control, and develop more specific, consistently applied, and currently meaningful security guarantees, consistent with the UN Charter, to states that observe that charter and observe their NPT obligations.* If non-proliferation and, more importantly, non-use of nuclear weapons are to continue, a security framework that supports states that help in this effort must exist regardless (within limits) of internal governance. A distinction must be made between states like Iran and Cuba that the United States does not like but which have neither

8 For similar and more extended views, see Beyond the Moscow Treaty, Testimony of John P. Holdren for the Committee on Foreign Relations, US Senate, Hearings on Treaty on Strategic Offensive Reductions, September 12, 2002.

9 NWS: nuclear weapons states under the NPT, namely the five permanent members of the UN Security Council, China, France, Russia, the UK and the US.

proliferated nor attacked any other state, and states like Iraq. As is perhaps obvious, the stance recommended here is incompatible with the use of military force to install more acceptable regimes, except in clear cases of violations of UN or NPT obligations. In those cases, the stance recommended would reinforce vigorous multilateral action. It may also be argued that strengthening the non-proliferation regime is not consistent with the first recommendation, to include *de facto* nuclear states which are not members of the NPR in verified limitations and agreed safety and security measures. This may be true from a legal point of view, but practically the measures suggested would make a nuclear force more expensive, subject to more intrusive international obligations, and less of a potential tool of aggression than is the case now.

- *The test-bed programs tasked with examining options for an international control regime to secure international trade against nuclear and other WMD terrorism mentioned earlier should receive explicit political and financial backing from the major trading states.* The actual design of a control regime cannot be specified until the test-bed programs are much further along. Indeed, it may not be desirable to have a single regime design dictated from the top. The contribution of the G-8 or other governmental group would be to follow the technical progress and present options for the legal international framework needed to enable an effective control regime. It is an open question to what extent existing international organizations would be able to take over some or the entire burden. The G-8 in particular must begin to lay the groundwork with the US Congress for a lasting international security system, including the funds to make it happen.

In summary, international regimes to control nuclear weapons are essential if the nuclear menace is to remain more or less tamed. Far from hampering US actions, only such agreements will allow the United States to continue in a role of leadership in this area. The reason is simple: the United States cannot do the job alone, and it stands to lose more than any other country if the job is not done. Nor can the prevention of nuclear terrorism be separated from efforts at non-proliferation, or those efforts separated from efforts at limiting or preventing arms races and securing nuclear arsenals.

APPENDIX

Nuclear issues in the post September 11 world
Fondation pour la Recherche Stratégique, Paris, 26-27 September 2002

Thursday, September 26

1000-1115: General outlook
Michael May, CISAC

1130-1230: Nuclear energy issues
Frank Umbach, DGAP

1330-1500: "Nuclear control" issues
Alexander Pikayev, CEIP; Jon Wolfstahl, CEIP

1515-1700: Nuclear deterrence issues
Brad Roberts, IDA; Michael Wheeler, SAIC

Friday, September 27

1000-1130: Regional nuclear issues
William Walker, University of Saint-Andrews : South Asia
Ariel Levite, IAEC (formerly CISAC) : the Middle East

1145-1230: Concluding session
Lewis Dunn, SAIC

List of participants:

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WHEELER Michael, Science Applications International Corporation, United States

WOLFSTAHL Jon, Carnegie Endowment for International Peace, United States

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